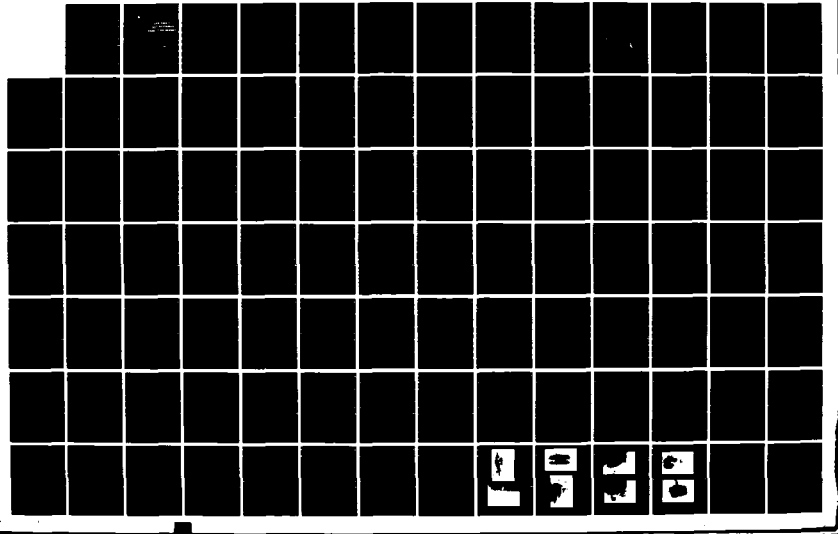
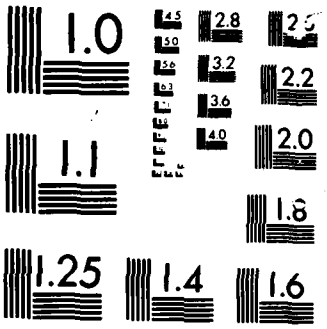
AD-A166 647 SAN DIEGO FLEET MOORINGS INSPECTION REPORT(U) NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC CHESAPEAKE DIV 30 NOV 82 CHES/NAVFAC-FPO-1-82(29) 1/2

UNCLASSIFIED F/G 13/10 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY
CHART

# SAN DIEGO FLEET MOORINGS INSPECTION REPORT

## 30 NOVEMBER

OCEAN ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, DC 20374

FPO-1-82 (29)

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

## REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION
Unclassified

1b. RESTRICTIVE MARKINGS

2a. SECURITY CLASSIFICATION AUTHORITY

3. DISTRIBUTION AVAILABILITY OF REP.
Approved for public release; distribution is unlimited

2b. DECLASSIFICATION/DOWNGRADING SCHEDULE

4. PERFORMING ORGANIZATION REPORT NUMBER
FPO-1-82(29)

5. MONITORING ORGANIZATION REPORT #

6a. NAME OF PERFORM. ORG. 6b. OFFICE SYM
Ocean Engineering
& Construction
Project Office
CHESNAVFACENGCOM

7a. NAME OF MONITORING ORGANIZATION

6c. ADDRESS (City, State, and Zip Code)
BLDG. 212, Washington Navy Yard
Washington, D.C. 20374-2121

7b. ADDRESS (City, State, and Zip )

8a. NAME OF FUNDING ORG. 8b. OFFICE SYM

9. PROCUREMENT INSTRUMENT INDENT #

8c. ADDRESS (City, State & Zip)

10. SOURCE OF FUNDING NUMBERS

| PROGRAM ELEMENT # | PROJECT # | TASK # | WORK UNIT ACCESS # |
|---|---|---|---|
| | | | |

11. TITLE (Including Security Classification)
San Diego Fleet Moorings Inspection Report

12. PERSONAL AUTHOR(S)

13a. TYPE OF REPORT 13b. TIME COVERED FROM TO 14. DATE OF REP. (YYMMDD) 82-11-30 15. PAGES 97

16. SUPPLEMENTARY NOTATION

17. COSATI CODES

| FIELD | GROUP | SUB-GROUP |
|---|---|---|
| | | |
| | | |

18. SUBJECT TERMS (Continue on reverse if nec.)
Mooring inspection, Fleet moorings, San Diego, CA

19. ABSTRACT (Continue on reverse if necessary & identify by block number)
Jnder the COMNAVFACENGCOM Fleet Mooring Maintenance (FMM) Program, CHESNAV-FACENGCOM has been assigned the responsibility to plan and conduct periodic diver inspections of all fleet moorings worldwide. In carrying out this responsibility CHESNAVFACENGCOM designated an Engineer-In-Charge (EIC) (Con't)

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
SAME AS RPT.

21. ABSTRACT SECURITY CLASSIFICATION

22a. NAME OF RESPONSIBLE INDIVIDUAL
Jacqueline B. Riley

22b. TELEPHONE 202-433-3881

22c. OFFICE SYMBOL

DD FORM 1473, 84MAR

SECURITY CLASSIFICATION OF THIS PAGE

BLOCK 19 (Con't)

to provide inspection planning and onsite technical direction for the underwater inspection of fleet moorings at PWC San Diego. The actual underwater portion of the inspection was performed by divers of Underwater Construction Team Two (UCT-2) which was requested to support CHESNAVFACENGCOM.

## TABLE OF CONTENTS



## LIST OF ILLUSTRATIONS

## APPENDICES

# PWC SAN DIEGO FLEET MOORING
# UNDERWATER INSPECTION REPORT

## 1.0 INTRODUCTION

1.1 Background. Under the COMNAVFACENGCOM Fleet Mooring Maintenance (FMM) Program, CHESNAVFACENGCOM has been assigned the responsibility to plan and conduct periodic diver inspections of all fleet moorings worldwide. In carrying out this responsibility CHESNAVFACENGCOM designated an Engineer-In-Charge (EIC) to provide inspection planning and onsite technical direction for the underwater inspection of fleet moorings at PWC San Diego. The actual underwater portion of the inspection was performed by divers of Underwater Construction Team Two (UCT-2) which was requested to support CHESNAVFACENGCOM. The positions of the 23 fleet moorings inspected at PWC San Diego are shown in Figures 1 and 2.

1.2 General Description of Moorings. The following classes of fleet moorings are still reported to be operational and were inspected at PWC San Diego:

| Class | Number |
|---|---|
| BB | 6 |
| B | 4 |
| C | 2 |
| D | 4 |
| E | 2 |
| G | 1 |
| Mediterranean | 3 |
| Not Reported | 1 |
| Total | 23 |

Nine of the above moorings, located in relatively shallow water near the deperming pier, are seldom used and consist of one to three legs attached to stake piles and/or stockless anchors. The remaining moorings are located near the Naval Station, NAS North Island, and near Harbor Island. All of the moorings are either riser- or telephone-type moorings except for three Mediterranean moorings. Figures 3 and 4 depict typical riser- and telephone-type moorings respectively. Figure 5 depicts a typical Mediterranean-type mooring.

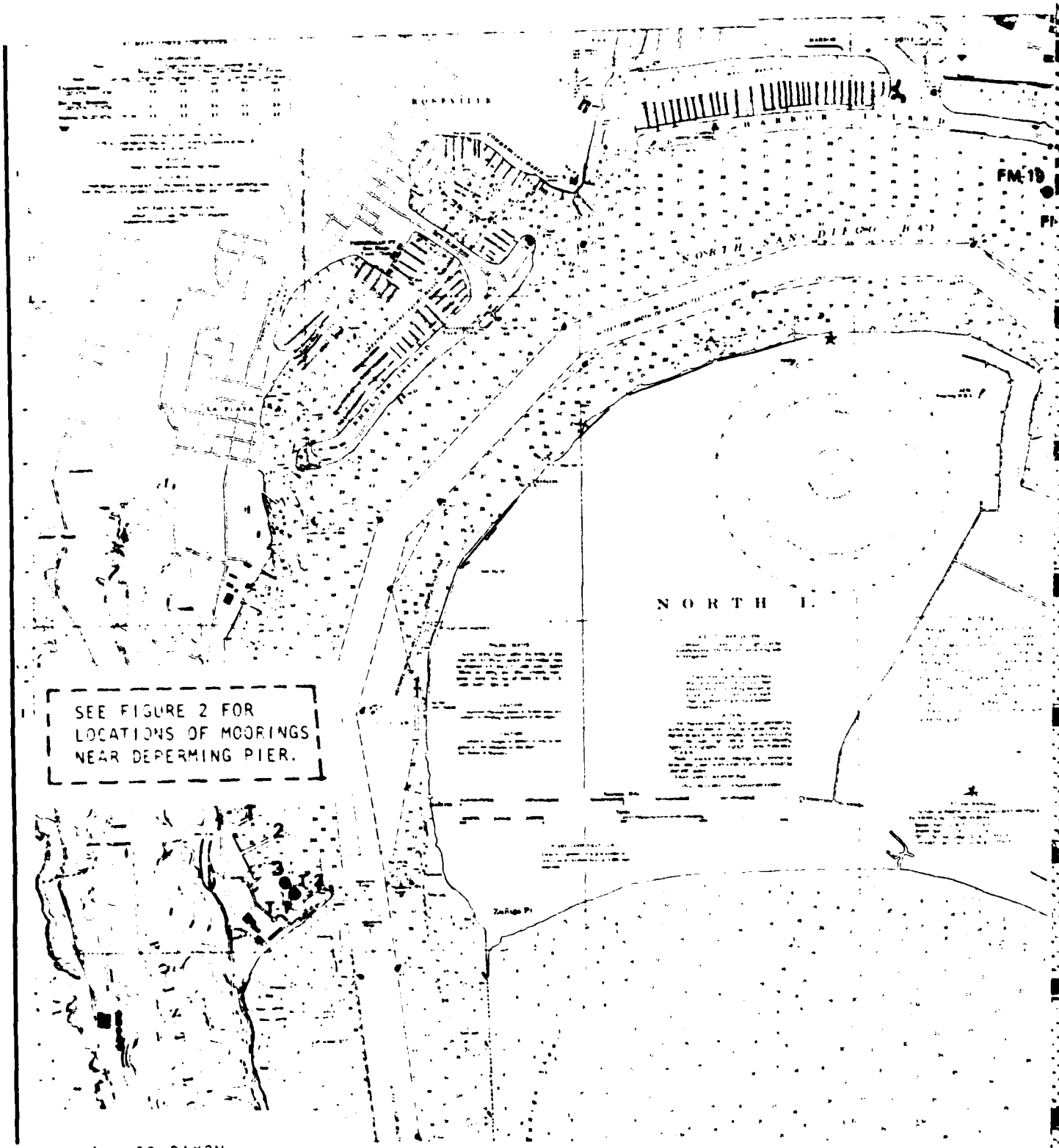



FIGURE 1. GEOGR

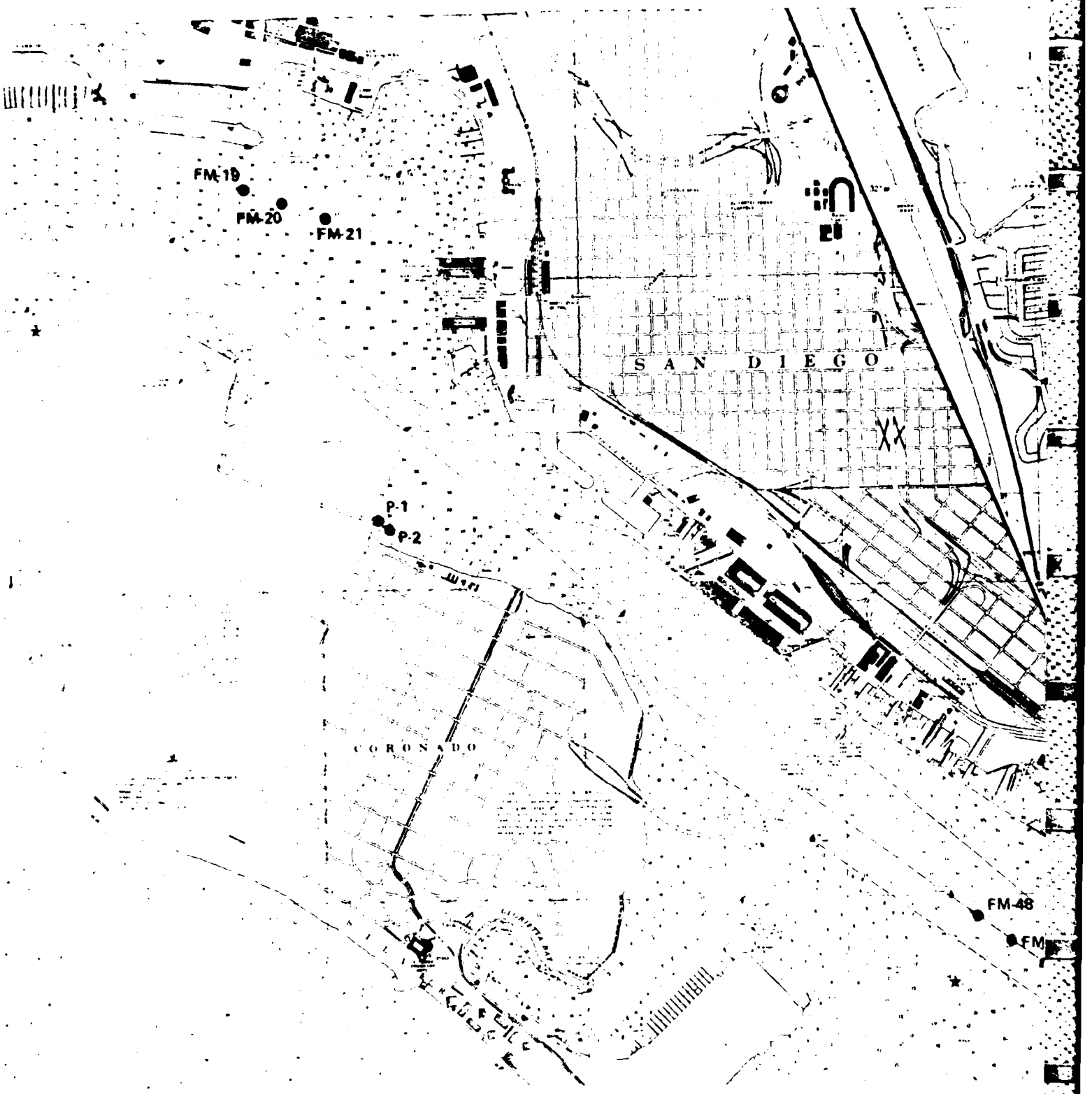
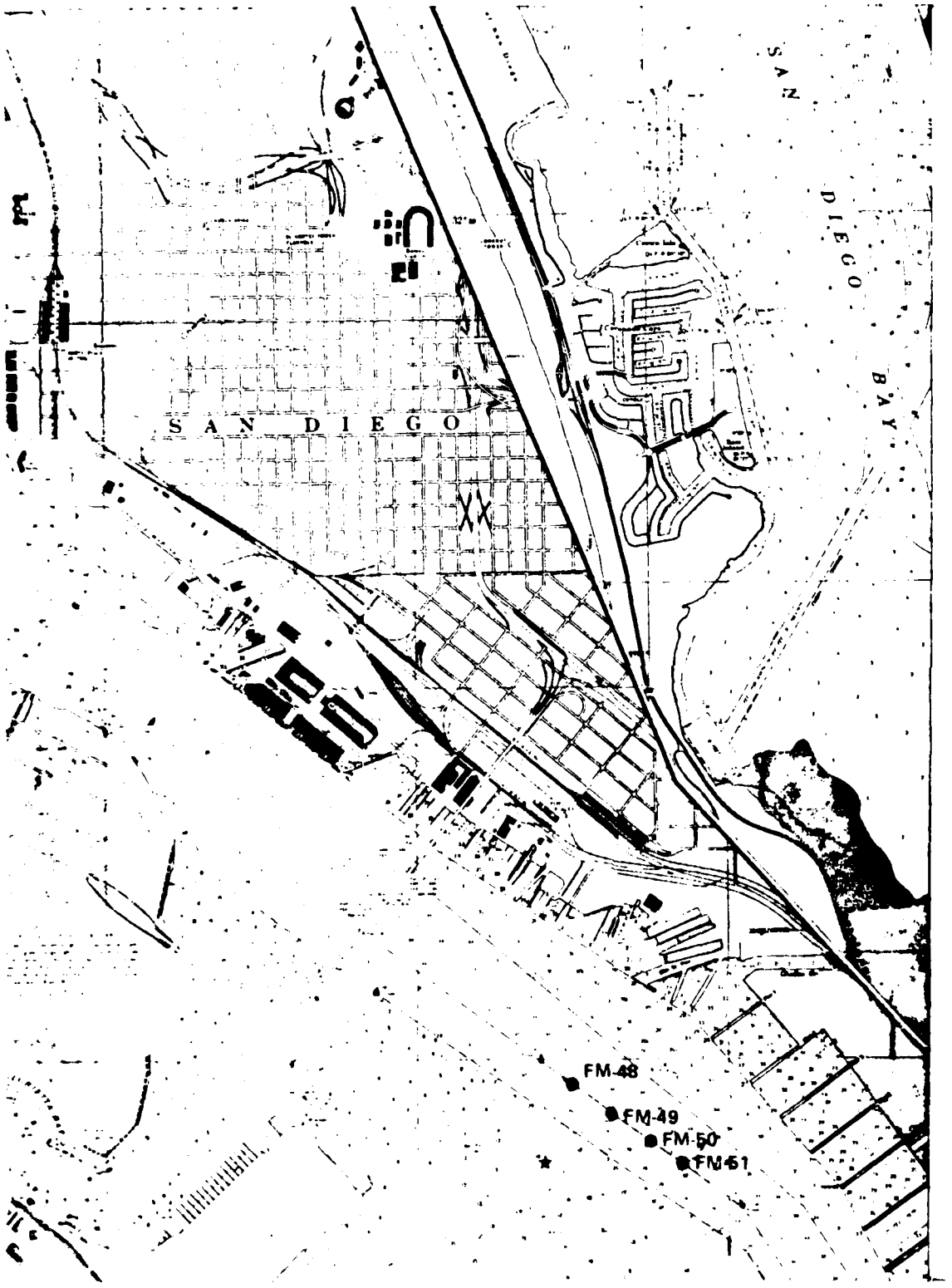



FIGURE 1 GEOGRAPHICAL POSITION OF MOORINGS


SAN DIEGO
SAN DIEGO BAY
FM-48
FM-49
FM-50
FM-51

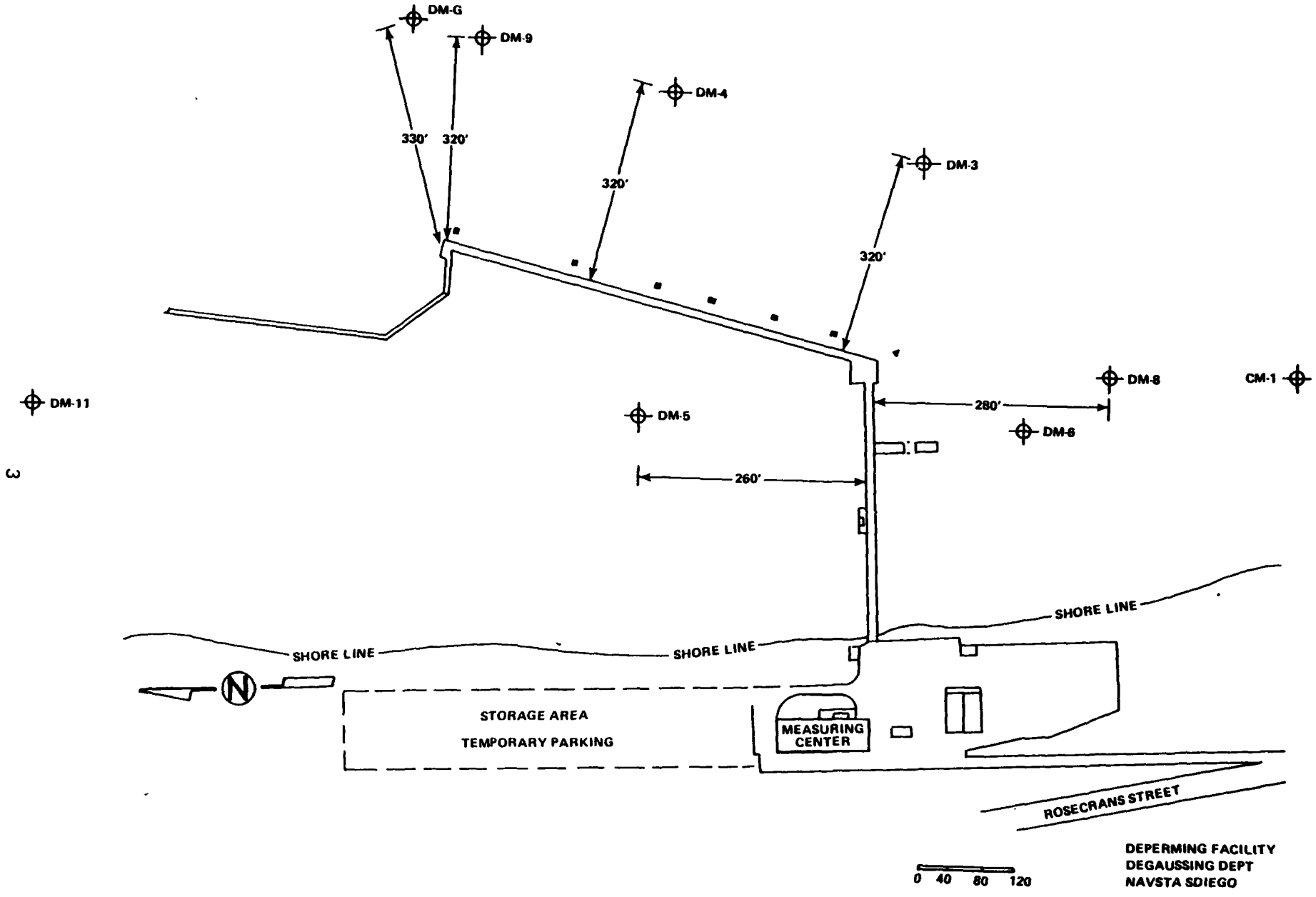



FIGURE 2. LATEST POSITION OF MOORINGS INSPECTED NEAR DEPERMING PIER

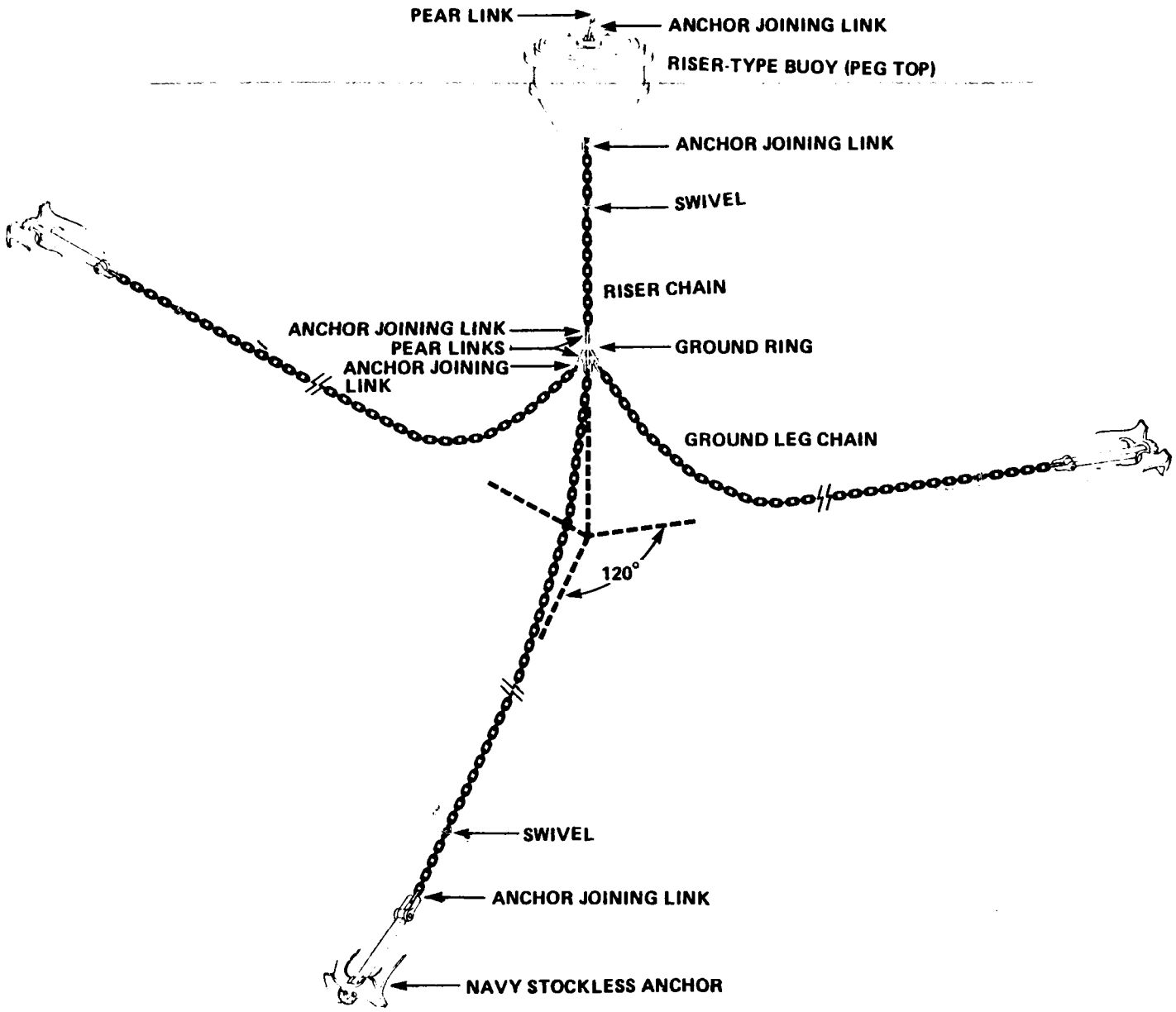



FIGURE 3. TYPICAL RISER-TYPE MOORING

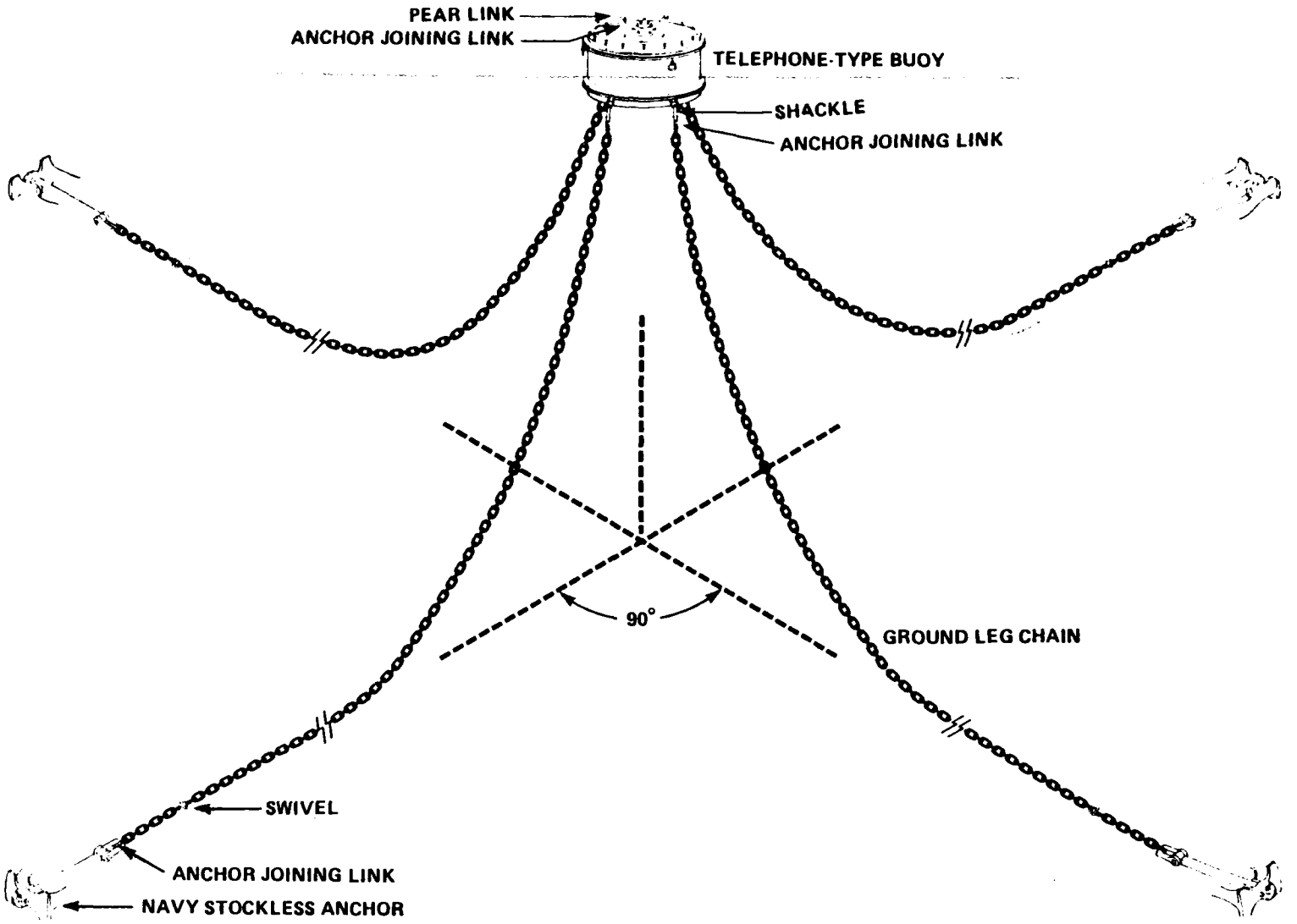



FIGURE 4. TYPICAL TELEPHONE-TYPE MOORING

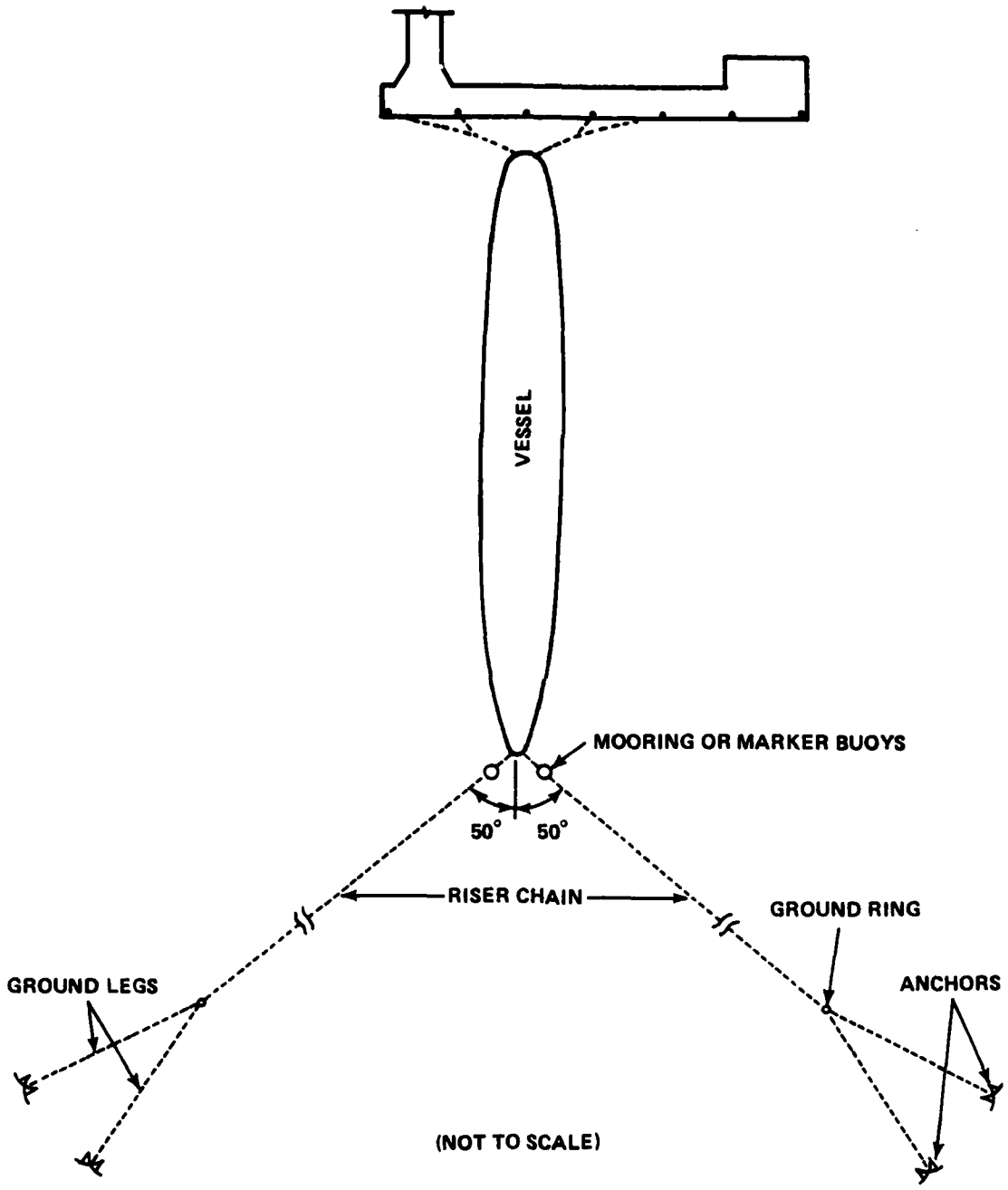



FIGURE 5. TYPICAL MEDITERRANEAN MOORING

## 2.0 INSPECTION PROCEDURES

2.1 Inspection Objectives. The purpose of the mooring inspections is to determine the general physical condition of the buoys and chain assemblies and, when possible, to verify or update existing as-built and maintenance records. Underwater inspections performed by divers sample only a portion of the submerged buoy hull and chain assemblies in order to compile a general description of the mooring's condition. The existence of fairly consistent measurements during this "selective sampling" inspection provides a good indication of the installation's overall condition. It should be kept in mind that periodic underwater inspections are intended as an expedient and relatively inexpensive supplement to accurate maintenance records. As such, they cannot fully substitute for a complete inspection involving recovery of the mooring and the measurement and evaluation of each component.

One of the more important parameters used to evaluate the condition of a mooring is chain wire diameter. After cleaning to bare metal, a selective sampling of the wire diameter of chain links and connecting hardware is taken in order to determine the amount of deterioration due to corrosion and wear. "Single Link" measurements are taken where chain is slack, and detect only corrosion loss. "Double Link" measurements, taken where two links connect under tension, detect the combined effects of corrosion and wear. Chain links and other components which measure greater than 90% of original wire diameter are considered "good" condition; measurement between 80% and 90% of original diameter is considered "fair" condition and is cause for the mooring to be downgraded in classification; any measurement less than 80% is considered "poor" and is cause for the mooring to be declared unsatisfactory for fleet use.

Standard underwater inspection procedures do not call for the inspection of any part of the mooring which has been buried. Ground legs and risers are observed only to the point at which they become buried; no attempt is made to locate and inspect anchors or other mooring materials which are not readily visible.

2.2 Buoy. The buoy was inspected and its general condition determined. The buoy markings were noted and checked for conformance with those noted in applicable charts. The buoy diameter was measured and recorded along with the freeboard dimensions. Physical damage, such as holes, dents, or listing, was reported. If the buoy was fiberglass coated, then the fiberglass was inspected for cracks, wear, peeling, and rust-bleeding. A check was also made to see if the hatches had been fiberglassed over. If the buoy had not been fiberglassed, the paint was checked for cracking, chipping, and peeling. Hatches, openings, and penetrations were examined and broken parts and rust were reported.

The buoy fenders and chafing rails were checked for integrity and secure connection to the buoy.

The buoy top chain jewelry was described and measured with calipers if their condition indicated significant wear.

Divers inspected the buoy below the waterline. The thickness of marine growth was recorded, three one-foot-square areas were selected and cleared of growth, and the condition of the paint or fiberglass was noted. If the buoy was cathodically protected, the condition, dimensions, and connection of the anodes were noted. Then, electrical potential readings were taken with an underwater voltmeter at three locations on the buoy bottom.

On all moorings, the bottom chain jewelry connecting the buoy to the riser (or to the ground legs in a telephone-type mooring) was identified and measured with calipers if their condition indicated significant wear.

2.3 Riser. To determine chain wear, each riser chain was inspected by taking three (3) consecutive double-link measurements, using precut gauges and/or calipers, at both ends and at the center of the riser. To determine original chain size, divers measured the length of a chain link and took single link caliper measurements of its wire diameter. Divers also documented the type of hardware connecting the riser chain to the ground ring.

2.4 Ground Legs. To determine chain wear, three (3) consecutive double link measurements were made at both ends and at the center of each leg until the anchor was reached or until the chain was buried in the seafloor. Where a segment of chain was resting on the bottom and was not in tension, single link measurements were taken instead of double link measurements. To determine original chain size, divers measured the length of a chain link and took single link caliper measurements of its wire diameter. The hardware connecting the ground legs to the ground ring was documented. The length of chain from the ground ring to the anchor (or to the point where the chain was buried in the mud) was recorded.

2.5 Ground Ring (Riser-Type Mooring). The ground ring was examined for general and localized wear. Caliper measurements were made of the wire size in the region of suspected wear. The depth of water at the ground ring was recorded by the divers.

2.6 Anchors. When located, the hardware connecting the anchors to the ground legs was measured by calipers in the same manner as the bottom chain jewelry. The condition, orientation, and type of each anchor found was recorded. A description of the bottom type was made at each anchor location.

2.7 Cathodic Protection System. Cathodic protection was found on only five (5) of the moorings inspected; these were: FM-19, FM-48, FM-49, FM-50, and FM-51. Underwater voltmeters were used to probe the chain every 45 feet commencing at the bottom chain jewelry and continuing until the anchor was reached or the chain disappeared into the bottom. The continuity cable was checked visually for proper attachment to chain links and anodes. Any anodes found were measured and the dimensions of the remaining zinc was recorded.

## 3.0 INSPECTION SUMMARY

3.1 Evaluation Criteria. The rationale used to evaluate the condition of the moorings at PWC San Diego is as follows:

(1) From diver measurements of chain size, determine into which classification the mooring falls;

(2) From these measurements, determine whether the mooring is in good condition (≥90%), in fair condition and should be downgraded one classification (≥80%), or in poor condition and not to be used (<80%);

(3) Compare this classification with the facility's required classification for this mooring;

(4) Note reasons why a particular mooring does not fulfill the requirements of any DM-26 classification.

A number of moorings at PWC San Diego do not fit standard classifications. Several are stake pile moorings (DM-6, DM-8, DM-9, DM-G, CM-1, and P-2) which cannot be placed in any DM-26 classification. FM-19 and FM-21 have seven legs which is not standard in DM-26. No estimates of the overall holding capacities of these moorings are specified.

3.2 Findings. The findings of the fleet mooring inspection conducted at PWC San Diego are generally satisfactory. Twenty-three moorings were inspected, and fourteen were in satisfactory condition. Five are recommended for downgrading, and four have been determined to be unsatisfactory for fleet use. A summary of the inspection results is contained in Table 1.

A check of the parts list provided by PWC San Diego has shown that die-lock chain is used in conjunction with cast steel chain in about 40% of the moorings. Paragraph 1.2.2.2 of MO 124 discourages the use

of this type of chain where excessive wear or abrasion is expected. Furthermore, different types of chain should not be joined in order to avoid accelerated galvanic corrosion that may occur when metals of dissimilar composition are joined underwater.

The estimated cost of procuring new chain assemblies to repair moorings with worn assemblies is $279,100 (FY83 Dollars). These material cost estimates were taken from the Fleet Mooring Maintenance Program Procurement Cost Estimates FY82 - FY86. The costs for FY83 have been inflated from FY82 data by using the March 1981 OSD Escalation Rate Table and should be viewed with caution since these inflation factors could be low. This cost estimate is for material procurement only and does not include shipping or labor costs. A breakdown of each mooring and its repair/overhaul cost is contained in Table 2.

## 4.0 MOORING MAINTENANCE RECOMMENDATIONS

4.1 An engineering evaluation based on the inspection data gathered by the inspection team has yielded the following recommendations.

- CM-1: The anchor for this mooring was reported to be standing upright on the bottom. Use of this mooring should be discontinued until it has been recovered and properly relaid.

- DM-3: The mooring chain measured >80% of original wire diameter. This mooring should be downgraded from a Class B to a Class C fleet mooring. The required class reported by PWC San Diego is Class D. Therefore, this mooring should be satisfactory for its intended use.

- DM-4: Ground leg 3 which measured <80% of original wire diameter must be replaced as soon as possible. Use of this mooring should be discontinued until an overhaul is completed.

- DM-5: Ground leg 3 measured >80% of original wire diameter. This mooring should be downgraded from a Class D to a Class E fleet mooring.

- DM-6: The riser chain measured <80%. Use of this mooring should be discontinued until the riser assembly is replaced.

- DM-8: The riser chain measured >80% of original wire diameter. Normally this mooring would be downgraded one classification. However, it does not fall into any standard classification and no estimate of its holding capacity is specified.

- FM-19: Use of this mooring should be discontinued until the sunken boat lying on its ground legs is removed and mooring is overhauled due to the damaged buoy.

- FM-21: Ground legs 4 and 7 measured >80% or original wire diameter. Normally this mooring would be downgraded one classification. However, it does not fall into any standard classification and no estimate of its holding capacity is specified.

- FM-48: The mooring chain measured >80% or original wire diameter. Normally this mooring would be downgraded one classification. However, it does not fall into any standard classification and no estimate of its holding capacity is specified.

- P-1: The riser chain and ground leg 1 measured >80% of original wire diameter. This mooring should be downgraded from a Class C to a Class D fleet mooring.

- T-1: The mooring chain measured >80% of original wire diameter. This mooring should be downgraded from a Class B to a Class C fleet mooring. The required class reported by PWC San Diego is Class E. Therefore, this mooring should be satisfactory for its intended use.

- T-2: The riser chain and ground leg 1 measured >80% of original wire diameter. This mooring should be downgraded from a Class B to a Class C fleet mooring. The required class reported by PWC San Diego is Class E. Therefore, it should be satisfactory for its intended use.

## TABLE 1. SAN DIEGO FLEET MOORING STATUS

| Mooring Number | Current Condition | | | Comments |
|---|---|---|---|---|
| | Good | Fair (Downgrade) | Poor (Unsat. for fleet use) | |
| CM-1 | | | ✔ | Unsatisfactory anchor orientation. |
| DM-3 | ✔ | | | Satisfactory for Class C use. |
| DM-4 | | | ✔ | Unsatisfactory ground leg. |
| DM-5 | | ✔ | | Ground leg worn; downgrade to Class E. |
| DM-6 | | | ✔ | Unsatisfactory riser. |
| DM-8 | | ✔ | | Riser chain worn; holding capacity unknown. Severe crack in padeye (16 inches long/1 inch deep). |
| DM-9 | ✔ | | | Satisfactory condition; holding capacity unknown. |
| DM-11 | ✔ | | | Satisfactory for Class B use. |
| DM-G | ✔ | | | Satisfactory condition; holding capacity unknown. |
| FM-19 | | | ✔ | Unsatisfactory condition; sunken boat lying on ground legs. |
| FM-20 | ✔ | | | Satisfactory for Class BB use. |
| FM-21 | | ✔ | | Worn ground legs; holding capacity unknown. |
| FM-48 | | ✔ | | Worn riser and ground legs; holding capacity unknown. |
| FM-49 | ✔ | | | Satisfactory for Class B use. |
| FM-50 | ✔ | | | Satisfactory for Class B use. |
| FM-51 | ✔ | | | Satisfactory for Class A use. |
| P-1 | | ✔ | | Ground legs worn; downgrade to Class D. |
| P-2 | ✔ | | | Satisfactory condition; holding capacity unknown. |
| T-1 | ✔ | | | Satisfactory for Class C use. |
| T-2 | ✔ | | | Satisfactory for Class C use. |
| U.S.S. DIXON | ✔ | | | Satisfactory condition. |
| U.S.S. ELK RIVER | ✔ | | | Satisfactory condition. |
| YFNB-5 | ✔ | | | Satisfactory condition. |

## TABLE 2. REQUIRED REPAIR/OVERHAUL ESTIMATED COSTS (FY 83 Dollars)

| Mooring # | Required Repair | | Material Cost |
|---|---|---|---|
| DM-4 | Replace Ground Leg Assembly #3 | | 20,330 |
| DM-5 | Replace Ground Leg Assembly #3 | | 20,330 |
| DM-6 | Replace Riser Chain Assembly | | 11,510 |
| DM-8 | Replace Riser Chain Assembly | | 11,510 |
| FM-21 | Replace Ground Leg Assemblies # 4 and 7 | | 57,800 |
| FM-48 | Complete Overhaul | | 125,760 |
| P-1 | Replace Riser Assembly and Ground Leg Assembly #1 | | 31,760 |
| | | Total | $279,000 |

# APPENDIX A

## MOORING INSPECTION REPORTS

The data presented in each section for each mooring contains all the information obtained by the inspection team. Each section contains three parts: (1) inspection results and recommendations; (2) a field page detailing diver measurements; and (3) a parts list provided by PWC San Diego for comparison with diver inspection reports. Diver-reported ground leg orientation was not considered in the evaluation of the condition of each mooring. However, in extreme cases if the legs are not correctly orientated this would have significant impact on the holding capacity of the mooring.

## MOORING CM-1 INSPECTION RESULTS AND RECOMMENDATIONS

**Buoy**

The 10 foot diameter peg-top buoy was reported to have severe fender deterioration. Its top chain jewelry was reported in satisfactory condition. The buoy was reported to have a 3 foot freeboard.

**Riser**

Diver measurements of the 2 1/2 inch riser chain verified that the chain was in good condition (> 90%). Divers reported seeing a clump and an anchor standing up on the bottom; however, they observed no connection of the riser chain to the clump.

**Ground Legs**

None.

**Conclusion/Recommendation**

Use of this mooring should be discontinued until it is recovered and reinstalled. This recommendation was not reported in the earlier message from CHESDIV because a complete evaluation of the inspection data was not completed.

MOORING NO.: CM-1 CLASS: G LOCATION: DEERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 45'/40' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: PEG TOP 10'ϕ 3' F.B.

DATE: 8/28/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. JOBBENS, J. PATIERNE

TIME: 1200

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (ASSUMED) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | FENDERS IN POOR CONDITION |
| RISER | NEAR BUOY | | 2½" | 2⅜* | | | 4¾* | | | | | |
| | MIDDLE | | ↓ | | | | | | | | | |
| | NEAR GRD RG | | ↓ | 2⅜* | | | 4¾* | | | | | |
| GROUND RING | | | | | | | | | | | | DIVERS NOTED |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | 1) Anchor standing up on bottom |
| | WEARPOINT | | | | | | | | | | | 2) Clump on bottom |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | 3) No visible connection of riser chain to clump. |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

CAMEL MOORING #1

Material Cost
$12,292

Location: South Side of Nuclear Pier

History:
1/64 Placed as CM #1
5/16/66 Picked Up and Relocated
9/26/66 Reconditioned and Relaid
6-5-68 Recovered, Inspected & Relaid

RISER CHAIN DETAILS

Drum Buoy (Small) W/Rubbing Casting
2 1/2" Detachable Link
2 1/8" "A" Link
2 1/8" Cast Steel Swivel
27'--2" C.S. Riser Chain
2 1/4" Detachable Link
5,000# Conc. Block
2½" Detachable Link
24'--2" C.S. Chain (Single Leg)
2½" Detachable Link
2½" N.T.G. (A.J. Link)
5,000# Stockless Anchor

Note: New Material has been used to recondition ground tackle--9/26/66

NEW MATERIAL

2 1/8" Cast Steel Swivel

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING DM-3 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 12 foot diameter, painted drum buoy with wooden fenders was reported to be in satisfactory condition. Its freeboard was reported to be 40 inches.

### Riser

The riser was found to consist of 2 1/2 inch chain which is larger than the 2 inch chain specified for a class D mooring in DM-26. Double link measurements along the riser chain indicated >80% of the original wire diameter was remaining. Divers reported 5 to 6 inch thick marine growth on the buoy bottom and riser chain. Significant amounts of corrosion were observed on the chain by divers. The ground ring was located at a water depth of 32 feet.

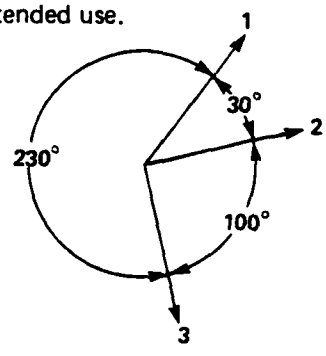
### Ground Legs

All three of the ground legs (2 1/2 inch chain) were reported to have >80% of its original wire diameter remaining. The ground legs are all buried within thirty feet of the ground ring. All three legs are oriented within a 130° sector of the bottom.

### Conclusion/Recommendation

Divers measured 2 1/2 inch mooring chain, which indicates a Class B mooring, according to DM-26. Records indicate San Diego uses this mooring as a Class D fleet mooring.

The chain on this mooring was found to have >80% of its original wire diameter remaining, which normally indicates a need to downgrade the mooring by one class. The resulting Class C is still higher than the Class D required so this mooring should be adequate for its intended use.




GROUND LEG ORIENTATION

MOORING NO.: DM-3 CLASS: D LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: * 35'/31' TYPE MOORING: [X] RISER [ ] TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: DRUM 12'ø 40° F.B.

DATE: 8/16/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. BUTTERFIELD, K. PLATT

TIME: 1530

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Painted, wooden fenders Good Condition |
| RISER | NEAR BUOY | | 2½" | 2½" | | | | | | | | Divers reported "LOTS OF OXIDATION" on chain |
| | MIDDLE | | 2½" | 2½" | | | | ✓ | | | | |
| | NEAR GRD RG | | 2½" | 2½" | | | | | | | | Divers calipered single links several times and resulted in 2½" chain. |
| GROUND RING | | | 4¾" | | 4" | | | | | 32' | | |
| GROUND LEG NO. 1 | UPPER END | | 2" | 2½" | | | | ✓ | | | | 10' from Ground Ring |
| | WEARPOINT | 030° | ↓ | | | | | | | | | chain buried in mud approx. 31 feet from Ground Ring |
| GROUND LEG NO. 2 | UPPER END | | | 2½" | | | | ✓ | | | | 10' from Ground Ring |
| | WEARPOINT | 060° | | | | | | | | | | chain buried in mud approx. 25 feet from Ground Ring |
| GROUND LEG NO. 3 | UPPER END | | | 2½" | | | | ✓ | | | | 10' from Ground Ring |
| | WEARPOINT | 160° | ↓ | | | | | | | | | chain buried in mud approx. 22 feet from Ground Ring |

BOTTOM TYPE: [ ] SAND [X] MUD [ ] CLAY [ ] CORAL [ ] ROCK

Visibility 1' D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING DM-3

RISER TYPE - CLASS "D"

3 LEGS

MATERIAL COST
$32,700

LEG "A" DETAILS

3" Bending Shackle
2½" NACO A. J. Link
2¼" Pear Link
2¼" Detachable Link
90' --2" C. S. Chain
2¼" Detachable Link
90' --2' C. S. Chain
2¼" Detachable Link
2¼" Pear Link
3" Bending Shackle
13,000# IMP. Stockless Anchor

LEG "B" DETAILS

3" Bending Shackle
2¼" Pear Link
2¼" Detachable Link
90' --2" C. S. Chain
2¼" Detachable Link
89' --2' C. S. Chain
2¼" Detachable Link
2¼" Pear Link
2½" NACO A. J. Link
13,000# IMP. Stockless Anchor

LEG "C" DETAILS

3" Bending Shackle
2½" NACO A. J. Link
2¼" Pear Link
2¼" Detachable Link
76' -- 2" C. S. Chain
2" Detachable Link
2¼" Pear Link
2½" Bending Shackle
13,000# IMP. Stockless Anchor

RISER CHAIN DETAILS

Drum Buoy (Small) W/Tension [illegible]
2½" NACO A. J. Link
27' --2½" C.S. Riser Chain
2½" Detachable Link
2½" E. Z. Link
2 9/16" Pear Link
3" Bending Shackle
4 3/4" x 18" I.D. Ground Ring

HISTORY:
3/15/55 New Installation
11/13/60 Reconditioned and Relaid
2/12/64 Reconditioned and Relaid
11/3/66 Reconditioned and Relaid
4/3/74 Reconditioned and Relaid

**THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.**

## MOORING DM-4 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The 10 foot diameter, painted drum buoy with 30 inch freeboard was found to be in satisfactory condition. The buoy has a top fender but lacks a chafing rail.

### Riser

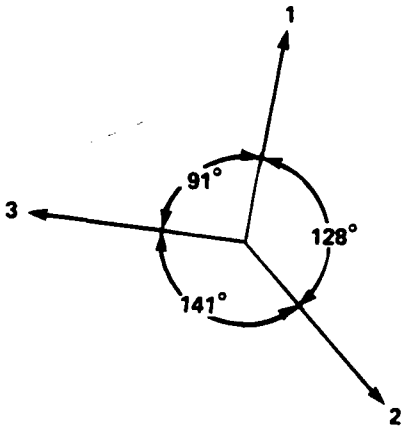
The 2 1/2 inch riser chain was reported to be in good condition. The ground ring, located at a water depth of 37 feet, was measured with calipers and found to be in good condition.

### Ground Legs

Ground legs 1 and 2, (2 inch wire diameter), were measured and reported to be in good condition. Ground leg 3 (2 1/4 inch chain) was reported to have severe wear and was badly pitted (>75%). The variation in double and single link measurements indicates that ground leg 3 may consist of segments of different sized chain.

### Conclusion/Recommendation

It is recommended that this mooring be discontinued for fleet use, until it has been overhauled. The basis for this recommendation is the double link measurement found on ground leg 3 which indicated original wire diameter remaining to be <80%.




GROUND LEG ORIENTATION

MOORING NO.: DM-4 CLASS: D LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 42'/37' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: DRUM 10'ϕ 30" F.B.

DATE: 8/23/82 ENGINEER-IN-CHARGE M. WALTER DIVER: #1 J. PATIERNE / S. HARDING

TIME: #1 1230 #2 1330 #3 0900 9/24/82 #2 S. HARDY / D. POELLET #3 J. PATIERNE / D. POELLET

| COMPONENTS | | BRNG | CONDITION NEW (FROM PARTS LIST) | SINGLE LINK % 90+ | SINGLE LINK % 80+ | SINGLE LINK % 80- | DOUBLE LINK % 90+ | DOUBLE LINK % 80+ | DOUBLE LINK % 80- | D | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BUOY-TOP HARDWARE | | | | | | | | | | | | PAINTED; TOP FENDERS - No Rubbing Rail |
| RISER | NEAR BUOY | | 2½" | | | | 4¾" | | | | | |
| | MIDDLE | | ↓ | | | | 4⅞" | | | | | |
| | NEAR GRD RG | | ↓ | | | | 5" | | | | | |
| GROUND RING | | | 5" | 5" | | | | | | 37' | | |
| GROUND LEG NO. 1 | UPPER END | 009° | 2" | 2" | | | 4" | | | | | |
| | WEARPOINT | | ↓ | | | | | | | | | |
| GROUND LEG NO. 2 | UPPER END | 132° | | 2" | | | 4¼" | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. 3 | UPPER END | 273° | | 2¼" | | | | | 3" | | | +75% BADLY PITTED CHAIN CHAIN MEASURED 15' from Ground Ring where it buries. |
| | WEARPOINT | | ↓ | | | | | | 3" | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING DM-4

RISER CHAIN TYPE - CLASS "D"

3 LEGS

MATERIAL COST
$32,400

LEG "A" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2¼" Detachable Link
90' -- 2" C. S. Chain
2¼" Detachable Link
90' -- 2" C. S. Chain
2¼" Detachable Link
2¼" Pear Link
2 3/4" Bending Shackle
13,000# Stockless Anchor

LEG "B" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2¼" Detachable Link
45' -- 2" C. S. Chain
2¼" Detachable Link
90' - 2" C. S. Chain
2¼" Detachable Link
90' -- 2" C. S. Chain
2¼" Detachable Link
2¼" Pear Link
2 5/8" NACO A. J. Link
13,000# Stockless Anchor

LEG "C" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2¼" Detachable Link
2¼" Pear Link
3" Bending Shackle
13,000# Stockless Anchor

RISER CHAIN DETAILS

Small Drum Buoy
3" Detachable Link
2 9/16" Pear Link
2½" Detachable Link
2 3/4" "B" & "C" Link
3 5/8" NACO A. J. Link
5" x 15" I.D. Ground Ring

HISTORY: 3/18/55 through 11/2/66

| | |
|---|---|
| 2/18/55 | New Installation |
| 4/6/60 | Reconditioned & Relaid |
| 2/13/64 | Reconditioned & Relaid |
| 11/2/66 | Reconditioned & Relaid |
| 3/70 | Overhauled (fm NAVFAC 9-11010) |

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING DM-5 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The 10 foot diameter, painted drum buoy has wooden fenders and a 2 1/2 foot freeboard. The general condition of the buoy was found to be satisfactory.

### Riser

The 2 3/4 inch riser chain was inspected and found to be in good condition.

### Ground Legs

Double link measurements taken on the 2 inch ground leg chains show good conditions for ground legs 1 and 2. Ground leg 3 was observed to have >80% of the original wire diameter remaining. The anchor on ground leg 3 was found and it was noted by divers that its flukes were sticking up into the water column.

### Conclusion/Recommendation

It was determined from the underwater inspection of this mooring that one of the ground legs has worn to the point where >80% of its original wire diameter is remaining, and that its respective anchor was not properly oriented into the seafloor. Based on these findings it is recommended that this mooring be downgraded from a Class D to a Class E fleet mooring until it is overhauled and brought up to DM-26 specifications for a Class D mooring.

MOORING NO.: DM-5 CLASS: D LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 28'/27' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: DRUM 10'ϕ 2½' F.B.

DATE: 8/19/82 ENGINEER-IN-CHARGE M. WALTER DIVER: S. HARDING J. TORRENS

TIME: 1430

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Wooden fenders at top |
| RISER | NEAR BUOY | | 2¾" | 2¾" | | | ✓ | | | | | |
| | MIDDLE | | ↓ | | | | | | | | | |
| | NEAR GRD RG | | ↓ | 2¾" | | | ✓ | | | | | |
| GROUND RING | | | 1½" | 5 | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 2" | | | | | | | | | |
| | WEARPOINT | | ↓ | 2" | | | ✓ | | | | | |
| GROUND LEG NO. 2 | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | 2" | | | ✓ | | | | | |
| GROUND LEG NO. 3 | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | ↓ | 2" | | | | ✓ | | | | Anchor was seen with flukes up. |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING DM-5

RISER TYPE - CLASS "D"

Material Cost
$42,400

RISER CHAIN DETAILS

Small Drum Buoy

2 3/4" Detachable Link

2 9/16" Pear Link

2 3/4" Detachable Link

16'-2 3/4" C.S. Riser Chain

2½" Naco A.J. Link

2 3/4" Bending Shackle

4½" x 18" I.D. Ground Ring
W/3-2 3/4" Bending Shackles

LEG "A" DETAILS

2½" Neco A.J. Link

2¼" Detachable Link

2¼" Pear Link

2 3/4" Bending Shackles

13,000 # IMP. Stockless Anchor

LEG "B" DETAILS

2½" Naco A.J. Link

2¼" Detachable Link

85' - 2" C.S. Chain

2¼" Detachable Link

2¼" Pear Link

2½" Naco A.J. Link

13,000 # IMP. Stockless Anchor

LEG "C" DETAILS

2½" Naco A.J. Link

2¼" Detachable Link

8' - 2" C.S. Chain

2¼" Detachable Link

97' - 2" C.S. Chain

2¼" Detachable Link

2¼" Pear Link

2½" Naco A.J. Link

13,000 # IMP. Stockless Anchor

HISTORY:

| | |
|---|---|
| 3-21-55 | New Installation |
| 4-4-60 | Reconditioned and Relaid |
| 1-27-64 | Reconditioned and Relaid |
| 2-2-67 | Reconditioned and Relaid |
| 3-70 | Overhauled |

**THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.**

## MOORING DM-6 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 12 foot diameter peg-top buoy with a 3 foot freeboard was reported to have medium rusting and light pitting. A timber chafing rail and two fenders were observed and the lower fender was reported to have been damaged. Eight to nine inch thick marine growth was reported by divers on the bottom of the buoy.

### *Riser*

The 2 3/4 inch riser chain was reported by divers to have <80% of its original wire diameter remaining. Marine growth eight to nine inches thick was observed along the riser; growth stops 5 feet above the bottom. The riser chain was observed to be slack on the bottom for about 15 feet before burying in the mud.

### Ground Legs

None.

### Conclusion/Recommendation

Resulting from <80% measurements found on the riser chain it is recommended that use of this mooring be discontinued until an overhaul occurs.

MOORING NO.: DM-6 CLASS: BB LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 25'/20' TYPE MOORING: [X] RISER [ ] TELEPHONE ANCHOR SIZE/TYPE: STAKE 2146 BUOY TYPE: PEG-TOP 12'ϕ 3' F.B.

DATE: 8/19/82 ENGINEER-IN-CHARGE M. WALTER DIVER: S. HARDY / J. BUTTERFIELD

TIME: 1030

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Rusting Light pitting Growth 8-9 inches thick |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | 2¾" | 2½' | | | | | 4½" | | | Slack on bottom, runs 15' then into bottom |
| | NEAR GRD RG | | | | | | | | | | | Growth stops at 20 feet |
| GROUND RING | | | | | | | | | | | | Diver reached 6" into sand, Felt chain |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: [X] SAND [ ] MUD [ ] CLAY [ ] CORAL [ ] ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

Established 7-30-76
Stake Pile 40' 12" "H" Beam

**Riser**

3 5/8" NACO
2 3/4" "B" & "C" link
2 3/4" Detachable link
34' 2 3/4" C.S. Chair riser
2 3/4" Detachable link
2 9/16" Pear link
3" Detachable link
MK II Peg top buoy

No Back up leg

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING DM-8 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 12 foot diameter peg-top buoy with a 3 foot freeboard was observed to have a severe crack (16 inches long/1 inch deep) in its top padeye. The buoy was equipped with a wooden chafing rail and two fenders. The top fender appeared to be in satisfactory condition and the fender at the waterline was beginning to deteriorate. Light pitting was reported on the buoy.

### Riser

The 2 3/4 inch riser chain was measured by divers and found to have >80% of its original wire diameter remaining. The chain runs from the buoy to the bottom, then along the bottom for 5 feet to where it buries in the sand. An H-pile was observed sticking 3 feet up into the water column 10 feet away from where the chain is buried. No back up leg was seen by the divers.

### Ground Legs

None.

### Conclusion/Recommendation

Double link measurements indicate the remaining wire diameter on the riser chain to be >80% of its original wire diameter. Normally this mooring would be downgraded one classification. However, it does not fall into any standard classification and no estimate of its holding capacity is specified. Immediate action should be taken to repair the crack in the buoy top padeye.

MOORING NO.: DM-8 CLASS: BB LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 25'/20½' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: H-Pile BUOY TYPE: 286-TOP 12'Ø 3' F.B.

DATE: 8/19/82 ENGINEER-IN-CHARGE M. WALTER DIVER: S. HARDING, J BUTTERFIELD

TIME: 1100

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Wooden fenders and rubbing rail. No Growth. |
| RISER | NEAR BUOY | | 2¾ | | | | | | | | | 16" L chain link |
| | MIDDLE | | ↓ | | 2¼ | | | 4½ | | | | |
| | NEAR GRD RG | | ↓ | | | | | | | | | Runs 5' on bottom, then into sand. 10' away, H-Pile sticks 3' from bottom. |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | Back-up leg not seen. |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: ☒ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

Established 7-30-76
Stake Pile 50' 12" "H" Beam

**Riser**

Mk II Peg top buoy
3 5/8" NACO
2 3/4" "B" & "C" link
2 3/4" Detachable link
47' 2 3/4" C. S. Chain riser
2 3/4" Detachable link
3" Detachable link

**Back up Leg**

2 9/16" Pear link
2 1/2" Detachable link
90' 2 1/2" D.L. Chain
2 1/2" Detachable link
45' 2 1/2" D.L. Chain
2 1/2" Detachable link
2 9/16" Pear link
20000# Anchor

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING DM-9 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The 12 foot diameter peg-top buoy with a 4 1/2 foot freeboard was reported to be in satisfactory condition. The buoy was equipped with a timber chafing rail and fenders at the top and at the waterline.

### Riser

The 2 3/4 inch riser chain was observed, measured with calipers, and found to be in good condition. Divers sited an H-pile sticking 6 feet up from the bottom.

### Ground Legs

None.

### Conclusion/Recommendation

The findings of the underwater inspection indicate that this mooring is in satisfactory condition for fleet use. However, it does not fall into any standard classification and no estimate of its holding capacity is specified.

MOORING NO.: DM-9 CLASS: BB LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 41'/39' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: STAKE PILE BUOY TYPE: NAG-TOP 12'ϕ 4½' F.B.

DATE: 8/23/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. PATIERNE/S. HARDY

TIME: 1330

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW ASSUMED | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Wooden fenders and rubbing rail |
| RISER | NEAR BUOY | | 2¾" | 2¾" | | | 5½" | | | | | |
| | MIDDLE | | ↓ | | | | | | | | | |
| | NEAR GRD RG | | ↓ | 2¾" | | | 5½" | | | | | |
| GROUND RING | | | | | | | | | | | | DIVERS SIGHTED H-PILE STICKING 6 feet up into water column |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING DM-11 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The painted peg-top buoy with a 12 foot diameter and 3 1/2 foot freeboard was reported to be without a chafing rail and was observed to have only one fender. Four to five inches of marine growth was reported. The general condition of the buoy was satisfactory.

### Riser

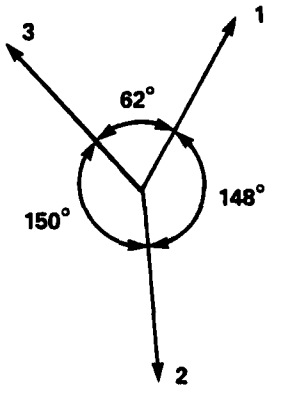
The 2 3/4 inch riser chain was reported to be in good condition. Rings of 4 1/2 inch wire diameter are used to attach the riser chain and all three of the ground legs to the ground ring. The ground ring was located at a water depth of 29 feet.

### Ground Legs

The 2 1/2 inch ground leg chain of each of the legs was reported to be in good condition.

### Conclusion/Recommendation

This mooring has been inspected and reported as satisfactory. The present status of this mooring is Class B by DM-26 specifications. PWC San Diego has been reporting it as a Class D fleet mooring.




GROUND LEG ORIENTATION

MOORING NO.: DM-11 CLASS: D LOCATION: DEGERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 35'/34' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: NAV-TOP 12'ø 44" F.B.

DATE: 8/19/82 ENGINEER-IN-CHARGE M. WALTER DIVER: S. HARDING, J. TORRENS

TIME: 1600

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW ASSUMED | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | No rubbing rail, wooden fender 4-5 inches of marine growth |
| RISER | NEAR BUOY | | 2¾" | 2¾" | | | 5¼ | | | | | |
| | MIDDLE | | ↓ | 2¾" | | | 5¼ | | | | | |
| | NEAR GRD RG | | ↓ | 2¾" | | | 5¼ | | | | | |
| GROUND RING | | | | 5" | | | | | | 29' | | |
| GROUND LEG NO. 1 | UPPER END | | 2¼" | 2¼" | | | 4⅞ | | | | | |
| | WEARPOINT | 027° | ↓ | | | | | | | | | |
| GROUND LEG NO. 2 | UPPER END | | | 2¼" | | | 4¼ | | | | | |
| | WEARPOINT | 175° | | | | | | | | | | |
| GROUND LEG NO. 3 | UPPER END | | | 2¼" | | | 4¼ | | | | | |
| | WEARPOINT | 325° | ↓ | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING DM-G INSPECTION RESULTS AND RECOMMENDATIONS

**Buoy**

The 12 foot diameter peg-top buoy with a 3 foot freeboard was reported in good condition. The buoy was equipped with a wooden chafing rail and fenders at the top and at the waterline.

**Riser**

The 2 1/2 inch riser chain was measured with calipers and reported by divers to be in good condition.

**Ground Legs**

None.

**Conclusion/Recommendation**

This mooring has been inspected and reported as satisfactory. However, it does not fall into any standard classification and no estimate of its holding capacity is specified.

MOORING NO.: DM-G CLASS: ? LOCATION: DEPERMING PIER LAT: _____ LONG: _____

WATER DEPTH: 38'/34' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: PEDESTOP 12'ϕ 3' F.B.

DATE: 8/23/82 ENGINEER-IN-CHARGE M. WALTER DIVER: S. HARDING, J. PATIERNE

TIME: 1430

| COMPONENTS | | BRNG | CONDITION | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | Wooden rubbing rail, and fenders |
| RISER | NEAR BUOY | | 2½" | 2½" | | | 4½" | | | | |
| | MIDDLE | | ↓ | | | | | | | | |
| | NEAR GRD RG | | ↓ | 2½" | | | 4½" | | | | |
| GROUND RING | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING FM-19 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The 12 foot diameter peg-top buoy was reported to be missing 90% of its lower fender. A 4 foot long, 2 inch deep dent was reported between the chafing rail and the top fender. The top fender and chafing rail were in satisfactory condition. The buoy is equipped with a light and has strips of reflective tape on the sides of its 51 inch freeboard.

### Riser

The 2 3/4 inch riser chain was reported by divers to be in good condition. The ground ring was located at a water depth of 27 feet.

### Ground Legs

Measurements were taken on ground leg 1 and found to be good. The remaining 6 ground legs were reported inaccessible by divers, because there was a sunken boat (approximately 56 feet long) lying on top of them. Divers reported that the connecting hardware on the ground ring was pulled to one side. The ground leg chains go down and under the boat. An anode was observed on ground leg 3.

### Conclusion/Recommendation

A complete inspection of this mooring was not possible. Use of the mooring should be discontinued until the boat is removed, the buoy is repaired, and the mooring chain is reinspected.

MOORING NO.: FM-19 CLASS: BB LOCATION: HARBOR ISLAND LAT: _____ LONG: _____

WATER DEPTH: *37'/32' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: ~~PEG~~ TOP 12'ϕ, 5" F.B.

DATE: 8/19/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. TORRENS, S. HARDY

TIME: 0830

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Buoy is equipped with a light. Dent 2 inches deep 4 feet long on side at top, near light |
| RISER | NEAR BUOY | | 2¾" | | | | | | | | | 90% of bottom fender missing |
| | MIDDLE | | ↓ | 2⅜" | | | 5½" | | | | .71 | |
| | NEAR GRD RG | | ↓ | | | | | | | | | |
| GROUND RING | | | | 6" | | | | | | 27' | .74 | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | 2½" | | | 5" | | | | .71 | |
| | WEARPOINT | | ↓ | | | | | | | | | Legs 2 through 7 were not accessible for inspection; sunken boat (56 feet long) on top of legs. Diver saw anode on one leg. |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | ↓ | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

ANODE MEASUREMENTS
21"L x 8"W x 8½"D

*Measured Depth/Depth to Mean Low Water Springs

FM-19

RISER CHAIN DETAILS

Peg Top Buoy MK 2
3 1/2" Detach
2 9/16" Pear Link
2 1/2" Detach
20' - 2 3/4" Dielock Riser Chain
2 3/4" Detach
3 1/4 " BC Link
5 - 3 5/8" NACO Links
Ground Ring 4 5/8" x 15" I.D.

Each anchor has 15' stabilizer bar welded to crown. The shank is welded at 30° angle.

Leg "A"
20,000 LB Stockless Anchor
3 1/4" Chain Shackle
2 3/4" BC Link
2 1/2" Detachable Link
45' - 2 1/2" Dielock Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 9/16" Pear Link

Leg "B"
20,000 LB Stockless Anchor
3 1/4" A.J. Link
3" Pear Link
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
45' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 9/16" Pear Link

Leg "C"
20,000 LB Stockless Anchor
3 1/4" A.J. Link
3" Pear Link
2 1/2" Detachable Link
45' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 1/16" Pear Link

Leg "D"
20,000 LB Stockless Anchor
3 1/2" A.J. Link
3" Pear Link
2 1/2" Detachable Link
45' - 2 1/2" Dielock Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc
2 1/2" Detachable Link
2 9/16" Pear Link

DEC. 77

FM-19 Chain Details (Continued)

Leg "E"
20,000 LB Stockless Anchor
3 1/4" A.J. Link
3" Pear Link
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
45' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 9/16" Pear Link

Leg "F"
20,000 LB Stockless Anchor
3 1/4" A.J. Link
3" Pear Link
2 1/2" Detachable Link
45' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 9/16" Pear Link

Leg "G"
20,000 LB Stockless Anchor
3 3/8" Bending Shackle
3" Pear Link
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
90' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
Zinc Annode
2 1/2" Detachable Link
45' - 2 1/2" Cast Steel Chain
2 1/2" Detachable Link
2 9/16" Pear Link

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING FM-20 INSPECTION RESULTS AND RECOMMENDATIONS

**Buoy**

This 16 foot diameter telephone-type buoy with wooden fenders was reported to be in satisfactory condition. The buoy was reported to be rusting lightly. It was also equipped with a light. Divers noted seeing a plastic tube extending from the bottom of the buoy to the mud line.

**Riser**

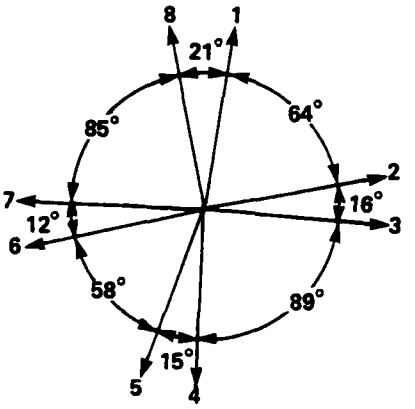
None.

**Ground Legs**

The eight ground legs were inspected and measured with calipers by divers. It was determined that all the chain is in good condition.

**Conclusion/Recommendation**

This mooring is considered it to be in satisfactory condition.




GROUND LEG ORIENTATION

MOORING NO.: FM-20 CLASS: BB LOCATION: HARBOR ISLAND LAT: _____ LONG: _____

WATER DEPTH: 42'/39½' TYPE MOORING: ☐ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: N5 BUOY TYPE: DRUM 16'6 49" F.B.

DATE: 8/18/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. TOZZENS, S. HARDING

TIME: 1230

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Light on buoy<br>Wooden fenders |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | | | | 4⅜" | | | | | 15½" ℄ chain link for #1 |
| | WEARPOINT | 016° | | | | | 5" | | | | | |
| GROUND LEG NO. 2 | UPPER END | | | | | | 4⅝" | | | | | |
| | WEARPOINT | 080° | | | | | 5" | | | | | |
| GROUND LEG NO. 3 | UPPER END | | | | | | 4½" | | | | | |
| | WEARPOINT | 096° | | | | | 5" | | | | | |

4 185° 4⅞" 5"

BOTTOM TYPE: ☐ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK

2 feet from mud line

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING NO.: FM-20 (cont.) CLASS: _____ LOCATION: _____ LAT: _____ LONG: _____

WATER DEPTH:* _____ TYPE MOORING: ☐ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: _____

DATE: 8/18/82 ENGINEER-IN-CHARGE _____ DIVER: _____

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | FROM PARTS LIST | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| TIGER GROUND LEG NO. 5 | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | 200° | 2½" | | | | 4 3/16" | | | | | |
| GROUND RING | | | | | | | 5" | | | | | 2' from mud line |
| GROUND LEG NO. 6 | UPPER END | | | | | | 4 3/16" | | | | | |
| | WEARPOINT | 258° | | | | | 5" | | | | | |
| GROUND LEG NO. 7 | UPPER END | | | | | | 4 5/8" | | | | | |
| | WEARPOINT | 270° | | | | | 5" | | | | | Buried 30' from buoy at 37 feet deep. |
| GROUND LEG NO. 8 | UPPER END | | | | | | 4 7/8" | | | | | |
| | WEARPOINT | 355° | | | | | 4 15/16" | | | | | |

BOTTOM TYPE: ☐ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING #20

TELEPHONE TYPE - CLASS "BB"

8 LEGS

MATERIAL COST
$122,171

Special Equipment - 1 - 50 Pair Tele. Cable
1 - 4" Plastic Water Line

LEG "A" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' -- 2½" D.L. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
90' -- 2½" C.S. Chain
2 ½" Detachable Link
2 ½" Pear Link
20,000# Imp. Stockless Anchor

LEG "B" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' -- 2½" C.S. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
5,000# Conc. Block
90' --2½" D.L. Chain
2 ½" Detachable Link
2 ½" Pear Link
20,000# Imp. Stockless Anchor

LEG "C" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' -- 2 ½" D.L. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
5,000# Conc. Block
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
2 ½" Pear Link
25,000# Conc. Block

LEG "D" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' --2 ½" C.S. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
5,000# Conc. Block
90' 2 ½" D.L. Chain
2 ½" Detachable Link
2 ½" N.T.G. (A.J. Link)
25,000# Imp. Stockless Anchor

LEG "E" DETAILS

3 ¼" Pear Link
3" Detachable Link
2 9/16" Pear Link
2 ½" Detachable Link
45' -- 2 ½" D.L. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
5,000# Conc. Block

LEG "F" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' -- 2 ½" C.S. Chain
2 ½" Detachable Link
90' -- 2 ½" C.S. Chain
2 ½" Detachable Link
5,000# Conc. Block

LEG "E" DETAILS Continued

90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
2 ½" Pear Link
3" Bending Shackle
25,000# Imp. Stockless Anchor

LEG "E" DETAILS Continued

90' -- 2 ½" C.S. Chain
2 ½" Detachable Link
2 ½" Pear Link
20,000# Imp. Stockless Anchor

LEG "G" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
45' -- 2 ½" D.L. Chain
5,000# Conc. Block
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
2 ½" Pear Link
2 ½" N.T.G. (A.J. Link)
25,000# Imp Stockless Anchor

LEG "H" DETAILS

3 ¼" Pear Link
3 ¼" Kenter Shackle
2 9/16" Pear Link
2 ½" Detachable Link
45' --2 ½" C.S. Chain
2 ½" Detachable Link
90' -- 2 ½" D.L. Chain
5,000# Conc. Block
90' -- 2 ½" D.L. Chain
2 ½" Detachable Link
2 ½" Pear Link
20,000# Imp. Stockless Anchor

HISTORY:

| | |
|---|---|
| 10/24/40 | Placed as M-15 |
| 1/21/48 | Reconditioned and Reinforced |
| 5/13/54 | Reconditioned |
| 6/15/61 | Renumber as M-22 |
| 5/2/62 | Reconditioned |
| 6/8/63 | Reconditioned and Reinforced |
| 6/22/65 | Reconditioned and Renumbered to M-20 |
| 10/17/67 | Reconditioned and Relaid |
| 3/72 | Overhauled (fm NAVFAC 9-11010) |

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING FM-21 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

The 11 foot diameter peg-top buoy, painted and equipped with a light, was inspected and found to be in satisfactory condition. The buoy was reported as having a 3 1/2 foot freeboard. Light rusting was reported to be present on the top hardware. The numbers on the buoy were reported as being "hardly visible."

### Riser

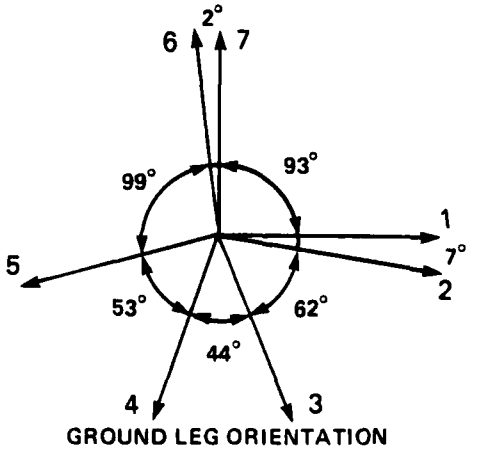
The 2 3/4 inch chain in the riser was found to be in good condition. The ground ring was located at a water depth of 31 feet and was also in good condition.

### Ground Legs

All the ground legs except for two were determined by divers to be in good condition. Those two ground legs (numbers 4 and 7) were found to be worn to the point that >80% of their original wire diameter was remaining. All of the legs are buried within 50 feet of the ground ring.

### Conclusion/Recommendation

Resulting from the two ground legs with >80% readings it is recommended that this mooring be downgraded. However, this mooring does not fall into any standard classification and no estimate of its holding capacity is specified.



GROUND LEG ORIENTATION

MOORING NO.: FM 21 CLASS: BB LOCATION: HARBOR ISLAND LAT: _____ LONG: _____

WATER DEPTH: 40'/38½' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: PEG TOP 11'Ø 42" F.D.

DATE: 8/18/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. TORRENS, S. HARDY

TIME: 1330

| COMPONENTS | | BRNG | CONDITION | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| RISER | NEAR BUOY | | 2¾" | | | | 5⅜" | | | | | 16'ℓ Chain link |
| | MIDDLE | | ↓ | | | | | | | 20' | | |
| | NEAR GRD RG | | ↓ | | | | 5¼" | | | | | |
| GROUND RING | | | 5½" | 5" | | | | | | 31' | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | | | | 5" | | | | | |
| | WEARPOINT | 093° | ↓ | | | | 5" | | | | | Buried 25' from Ground Ring at 37' deep. |
| GROUND LEG NO. 2 | UPPER END | | | | | | 4⅝ | | | | | |
| | WEARPOINT | 100° | | | | | 4⅝ | | | | | Buried 30' from Ground Ring at 38' deep. |
| GROUND LEG NO. 3 | UPPER END | | | | | | 4⅝ | | | | | |
| | WEARPOINT | 162° | | | | | 4⅜ | | | | | Buried 60' from Ground Ring at 38' deep. |
| 4 | | 206° | ↓ | | | | | 4⅞" 4⅜" | | | | Buried 20' from Ground Ring at 38' deep. |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING NO.: EM-21 (cont.) CLASS: _____ LOCATION: _____ LAT: _____ LONG: _____

WATER DEPTH:* _____ TYPE MOORING: ☐ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: _____

DATE: _____ ENGINEER-IN-CHARGE _____ DIVER: _____

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. 5 | UPPER END | | 2½" | | | | 4¼" | | | | | SINGLE LEG |
| | WEARPOINT | 259° | | | | | 4¾" | | | | | Buried 40' from Ground Ring at 38' deep |
| GROUND LEG NO. 6 | UPPER END | | | | | | 4¾" | | | | | |
| | WEARPOINT | 358° | | | | | 4¾" | | | | | Buried 30' from Ground Ring at 38' deep |
| GROUND LEG NO. 7 | UPPER END | | | | | | | 4½" | | | | |
| | WEARPOINT | 360° | | | | | | 4½" | | | | |

BOTTOM TYPE: ☐ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING #21

RISER TYPE - CLASS "BB"

7 LEGS

MATERIAL COST
$122,263

LEG "A" DETAILS

3 5/8" NACO Anchor Joining Link
2 9/16" Pear Link
2½" Detachable Link
90' -- 2½" C. S. Chain
2½" Detachable Link
45' -- 2½" C. S. Chain
2½" Detachable Link
5,600 # Concrete Block
90' -- 2½" C. S. Chain
2½" Detachable Link
2½" Pear Link
20,000 # Stockless Anchor

LEGS "B" "C" AND "D" DETAILS

Identical to Leg "A" except for large 2 9/16" Pear Links in Jew Harp

LEGS "E" "F" AND "G"

Identical to Leg "A" except for 2½" x 2 3/4" Anchor Joining Link in Jews Harp

NEW MATERIAL

1 -- 2 9/16" Pear Link

RISER CHAIN DETAILS

MK, II Peg Top Buoy #185
3¼" Detachable Link
2 9/16" Pear Link
2 3/4" Detachable Link
20' -- 2 3/4 Die Lock Chain
2 3/4" Detachable Link
2 3/4" "B" and "C" Link
3 5/8" NACO Anchor Joining Link
5½" x 18" I.D. Ground Ring

HISTORY

| | |
|---|---|
| 10/29/40 | Placed as M-16 |
| 1/20/45 | Reconditioned and reinforced |
| 5/18/56 | Reconditioned |
| 1/18/59 | Reconditioned |
| 6/15/61 | Renumbered M-23 |
| 6/28/63 | Pick up, reconditioned, Reinforced, and Relaid |
| 6/23/65 | Relocated and Renumbered to 7 |
| 6/3/66 | Reconditioned |
| 9/27/68 | Reconditoned |
| 3/72 | Overhauled (for NAVFAC [illegible]) |
| 8/23/76 | Changed Buoy (sinking) |

**THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.**

## MOORING FM-48 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 11 foot diameter, painted drum buoy with a five-foot freeboard and two wooden fenders was reported in satisfactory condition. One to six inches of marine growth was reported by divers on the bottom of the buoy and along the riser chain.

### Riser

Double link measurements taken along the riser chain proved the chain was worn to just below 90% of its original wire diameter and is therefore in fair condition. The ground ring, located at a water depth of 25 feet, was reported in good condition.

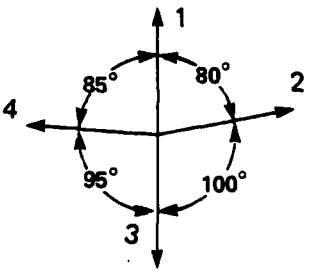
### Ground Legs

The 2 1/2 inch chain, on all four of the ground legs, was reported by divers to be worn to less than 90% but not more than 80% of its original wire diameter (fair condition).

Continuity cable and anodes were observed by divers on only two of the four ground legs.

### Conclusion/Recommendation

Resulting from double link chain measurements of >80%, it is recommended that this mooring be downgraded. However, this mooring does not fall into any standard classification and no estimate of its holding capacity is specified.



GROUND LEG ORIENTATION

MOORING NO.: FM-18 CLASS: B LOCATION: NAVSTA LAT: _____ LONG: _____

WATER DEPTH: *1 43'/40' *2 8/17/82 TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: DRUM 11'ϕ 5' F.B.

DATE: *2 8/18/82 *1 12 15 ENGINEER-IN-CHARGE M. WALTER DIVER: B. HURT, J. PATIGNO B. HURT, N. GUEST

TIME: *2 0930

| COMPONENTS | | BRNG | CONDITION: NEW (FROM PARTS LIST) | SINGLE LINK % 90+ | SINGLE LINK % 80+ | SINGLE LINK % 80- | DOUBLE LINK % 90+ | DOUBLE LINK % 80+ | DOUBLE LINK % 80- | D | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BUOY-TOP HARDWARE | | | | | | | | | | | | PAINTED; WOODEN FENDERS 1"-6" marine growth |
| RISER | NEAR BUOY | | 2½" | | | | | ✓ | | | | DIELOCK CHAIN |
| | MIDDLE | | ↓ | | | | | | | | | |
| | NEAR GRD RG | | ↓ | | | | | ✓ | | | | |
| GROUND RING | | | | 43½' | | | | | | 25' | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | | | | | ✓ | | | | CONTINUITY CABLE STARTS AT FIRST REGULAR CHAIN LINK - ⅜"ϕ |
| | WEARPOINT | 0° | ↓ | | | | | ✓ | | | -.71 | |
| GROUND LEG NO. 2 | UPPER END | | | | | | | ✓ | | | | CONTINUITY CABLE STARTS AT FIRST REGULAR CHAIN LINK - ⅜"ϕ |
| | WEARPOINT | 80° | | | | | | ✓ | | | -.71 | |
| GROUND LEG NO. 3 | UPPER END | | | | | | | ✓ | | | -.71 | NO CONTINUITY CABLE SEEN |
| | WEARPOINT | 180° | ↓ | | | | | ✓ | | | | |
| LEG No. 4 | | 270° | 2½" | | | | | | | | -.71 | NO CONTINUITY CABLE SEEN |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

ANODE MEASUREMENTS
24"L x 12"W x 12"D

BOUY #48 RISER TYPE

LEG "A"

20K Anchor
2-1/2' Detach to the Anchor
2 - 90' 2-1/2" Stud Link Chain (Cast Steel)
1 - 45' 2-1/2" Stud Link Chain (Cast Steel)
2 Zinc Anodes w/3/4" Galv. Wire
3 - 2-1/2" Detaches

LEGS "B", "C", & "D" - SAME AS LEG "A"

RISER

1 Ground Ring
1 2-3/4" Detach
19 Ft - 2-3/4" Stud Link Chain (Dielock)
1 2-3/4" Detach

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING FM-49 INSPECTION RESULTS AND RECOMMENDATIONS

**Buoy**

This 9 foot diameter, painted telephone-type buoy with two wooden fenders was reported in fair condition. Bands of rust bleeding were observed on the buoy's 44 inch freeboard. The buoy is equipped with a light.

**Riser**

None.

**Ground Legs**

The 2 1/2 inch chain on all four of the ground legs was reported in good condition (>90%).

Anodes and continuity cables were observed by divers on three of the four ground legs. Underwater voltmeters yielded satisfactory potential readings over the entire mooring system.

**Conclusion/Recommendation**

This mooring is considered to be in satisfactory condition.

MOORING NO.: EM-19 CLASS: B LOCATION: NAVSTA LAT: _____ LONG: _____

WATER DEPTH: *40'/36' TYPE MOORING: ☐ RISER ☒ TELEPHONE ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM 9'Ø 44" F.B.

*1 8/17/82

DATE: *2/18/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. TORRENS, S. HARDY B. HURT, N. GUEST

TIME: *1 1050 *2 1030

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | -0.83 | Buoy in fair condition |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | 2½" | | | ✓ | | | 20' | -0.85 | BROKEN CONTINUITY CABLE |
| | WEARPOINT | 080° | | | | | ✓ | | | | -0.95 | Runs out 20' Anode on bottom |
| GROUND LEG NO. 2 | UPPER END | | | 2½" | | | ✓ | | | 20' | -0.85 | CABLE in good condition |
| | WEARPOINT | 210° | | | | | ✓ | | | | -1.03 | Anode on bottom |
| GROUND LEG NO. 3 | UPPER END | | | 2½" | | | ✓ | | | 20' | -0.95 | |
| | WEARPOINT | | | | | | ✓ | | | | -0.95 | Very loose continuity cable anode suspended at 37' |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Divers reported 1" of rust products on anodes.

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

ANODE MEASOREMENTS

24"L x 10"W x 10"D

## MOORING # 49

## TELEPHONE TYPE - CLASS "B"

4 LEGS — MATERIAL COST $59,900

LEG "A" DETAILS

3½" NACO A. J. Link
2 9/16" Pear Link
2½" Detachable Link
45' -- 2½" D. L. Chain
2½" Detachable Link
90' -- 2½" C. S. Chain
2½" Detachable Link
5,000 # Conc. Block
90' -- 2½" C. S. Chain
2½" Detachable Link
2½" "B" Link
2½" Anchor Joining Link
20,000 #IMP Stockless Anchor

LEG "B" DETAILS

3 ¼" Pear Link
2½" Bending Shackle
2 9/16" Pear Link
2½" Detachable Link
90' -- 2½" C. S. Chain
2½" Detachable Link
45' -- 2½" C. S. Chain
2½" Detachable Link
5,000 # Conc. Block
90' -- 2½" C. S. Chain
2½" Detachable Link
2 9/16" Pear Link
2½" Anchor Joining Link
20,000 #IMP Stockless Anchor

LEG "C" DETAILS

3 ¼" Pear Link
2½" Bending Shackle
2 9/16" Pear Link
2½" Detachable Link
45' -- 2½" C. S. Chain
2½" Detachable Link
90' -- 2½" C. S. Chain
2½" Detachable Link
5,000 # Conc. Block
90' -- 2½" C. S. Chain
2½" Detachable Link
2 9/16" Pear Link
2½" Anchor Joining Link
20,000 # IMP Stockless Anchor

LEG "D" DETAILS

3 ¼" Pear Link
2½" Bending Shackle
2 9/16" Pear Link
2½" Detachable Link
90' -- 2½" C. S. Chain
2½" Detachable Link
45' -- 2½" D. L. Chain
2½" Detachable Link
50000 # Conc. Block
90' -- 2½" C. S. Chain
2½" Detachable Link
2 9/16" Pear Link
2½" Anchor Joining Link
20,000 #IMP Stockless Anchor

HISTORY:

| | |
|---|---|
| 2/16/42 | Placed as Mooring 45 |
| 5/5/43 | Relocated as Mooring 49 |
| 3/13/53 | Renewed Chain and Strengthened |
| 8/15/55 | Reconditioned and Relocated |
| 11/5/59 | Reconditioned and Relaid |
| 6/2/64 | Renewed Chain, Changed to Telephone Type and Relocated |
| 4/17/67 | Reconditioned and Relaid |
| 12/22/69 | Reconditioned and Relaid |
| 3/3/73 | Picked up and Relaid |
| 11/4/75 | For Dredging |
| 4/76 | Overhauled (for NAVFAC 9-11010) |

**THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.**

## MOORING FM-50 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 12 foot diameter drum buoy, with a 3 foot freeboard and wooden fenders, was inspected and determined to be in satisfactory condition.

### Riser

The 2 1/2 inch riser chain was measured by divers and reported in good condition (>90%). The ground ring, located at a water depth of 33 feet, was covered with mud and was reported to be in good condition.

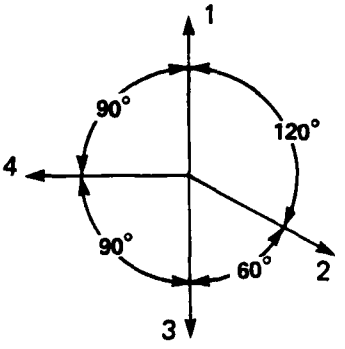
### Ground Legs

The visible ground leg chain was measured and reported by divers to be in good condition. The ground legs are buried in the mud within 30 feet of the ground ring.

The cathodic protection system was working satisfactorily (determined by voltmeter readings). Divers reported seeing continuity cable on the ground legs, starting at the first regular chain link. No anodes were observed.

### Conclusion/Recommendation

This mooring, as a Class B fleet mooring, has been found to be in satisfactory condition.




GROUND LEG ORIENTATION

MOORING NO.: FM-50 CLASS: B LOCATION: NAVSTA LAT: _____ LONG: _____

WATER DEPTH: 38'/35' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: N5 BUOY TYPE: DRUM 12'Ø 25" F.B.

DATE: 8/12/82 ENGINEER-IN-CHARGE M. WALTER DIVER: B. HURT, J. PATIGNE

TIME: 0730

| COMPONENTS | | BRNG | CONDITION NEW | SINGLE LINK % 90+ | SINGLE LINK % 80+ | SINGLE LINK % 80- | DOUBLE LINK % 90+ | DOUBLE LINK % 80+ | DOUBLE LINK % 80- | D | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BUOY-TOP HARDWARE | | | ✓ | | | | | | | | | WOODEN FENDERS No Growth |
| RISER | NEAR BUOY | | | 2½" | | | ✓ | | | | | 17" chain link |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | ✓ | | | | | |
| GROUND RING | | | | 4½" | | | | | | | -.95 | 3' above bottom covered with mud. |
| GROUND LEG NO. 1 | UPPER END | | | 2½" | | | ✓ | | | | -.96 | All the legs bury 25' |
| | WEARPOINT | 000° | | | | | | | | | | to 30' from Ground Ring |
| GROUND LEG NO. 2 | UPPER END | | | 2½" | | | ✓ | | | | -.95 | Continuity cable starts at |
| | WEARPOINT | 120° | | | | | | | | | | first regular chain link |
| GROUND LEG NO. 3 | UPPER END | | | 2½" | | | ✓ | | | | -.96 | on all of the legs. |
| | WEARPOINT | 180° | | | | | | | | | | |
| 4 | | 270° | | 2½" | | | ✓ | | | | -.96 | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

FM - 50

Installed 5 AUGUST 1982

RISER DETAILS

Mk 2 Peg Top Buoy
3 5/8" NACO Towing Link
2 9/16" Pear Link
2 1/2" Detach
28' 2 3/4" Dielock Chain
2 1/2" Detach
2 9/16" Pear Link
3 5/8" NACO Joining Link
GROUND RING

LEG A, B, AND C

3 5/8" NACO Joining Link
2 9/16" Pear Link
2 1/2" Detach
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
ZINC ANODE
2 1/2" Detach
1/2 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
ZINC ANODE
2 1/2" Detach
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
2 9/16" Pear Link
20,000# Anchor

LEG D

3 5/8" NACO Joining Link
2 9/16" Pear Link
2 1/2" Detach
1/2 Shot Cast Steel Chain
2 1/2" Detach
ZINC ANODE
2 1/2" Detach
1 Shot Cast Steel Chain
2 1/2" Detach
ZINC ANODE
2 1/2" Detach
1 Shot Cast Steel Chain
2 1/2" Detach
2 9/16" Pear Link
20,000# Anchor

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING FM-51 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 12 foot diameter drum buoy with 34 inch freeboard was reported in excellent/new condition. The buoy is equipped with wooden fenders at the top and at the waterline; both are in satisfactory condition.

### Riser

The 2 3/4 inch riser chain was reported by divers in good condition (>90%). The ground ring located on the bottom at a depth of 42 feet was in good condition.

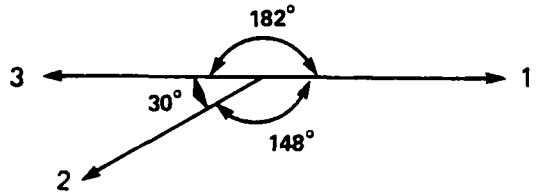
### Ground Legs

Double link measurements taken along the ground leg chain were greater than 90% for all three of the ground legs. All three legs bury in the mud 10 feet from the ground ring.

Underwater voltmeter readings taken over the entire mooring indicated that the cathodic protection system was intact. Divers reported seeing no anodes and continuity cable on only two of the three legs.

### Conclusion/Recommendation

This mooring, as a Class A fleet mooring, has been found in satisfactory condition.




GROUND LEG ORIENTATION

MOORING NO.: FM 51 CLASS: B LOCATION: NAVSTA LAT: _____ LONG: _____

WATER DEPTH:* 42'/39' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NC BUOY TYPE: DRUM 12'ϕ 84" F.D.

DATE: 8/17/82 ENGINEER-IN-CHARGE M. WALTER DIVER: J. TORRENS, S. HARDY

TIME: 0800

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | ✓ | | | | | | | | -1.02 | Wooden fenders excellent condition. |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | 2¾" | | | ✓ | | | 20' | -1.02 | 18" chain link |
| | NEAR GRD RG | | | | | | | | | | -1.00 | |
| GROUND RING | | | | 4¾" | | | | | | 42' | -1.01 | |
| GROUND LEG NO. 1 | UPPER END | | | 2¾" | | | ✓ | | | | -0.85 | |
| | WEARPOINT | 092° | | | | | | | | | | runs out 10' - buries |
| GROUND LEG NO. 2 | UPPER END | | | 2¾" | | | ✓ | | | | -1.01 | continuity cable seen |
| | WEARPOINT | 240° | | | | | | | | | | runs out 10' - buries |
| GROUND LEG NO. 3 | UPPER END | | | 2¾" | | | ✓ | | | | -1.02 | no anodes were seen. |
| | WEARPOINT | 270° | | | | | | | | | | runs out 10' - buries |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility 1½' D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

FM-51

Installed 10 August 1982

## RISER DETAILS

MK 2 Peg Top Buoy
2 3/4 " Detach
2 9/16" Pear Link
2 1/2" Detach
28' 2 3/4" Dielock Chain
B & C Link
3 5/8" NACO Joining Link
Ground Ring

### LEG A

3 5/8" NACO Joining Link
2 9/16" Pear Link
2 1/2" Detach
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1/2 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
2 1/16" Pear Link
3 5/8" NACO Joining Link
20,000 LB. Anchor with Stabilizer

### LEG B

3 5/8" NACO Joining Link
2 9/16" Pear Link
2 1/2" Detach
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1/2 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
Zinc Anode
1 Shot 2 1/2" Cast Steel Chain
2 1/2" Detach
B Link
C Link
Shackle
30,000 LB. Anchor with Stabilizer

### LEG C

3 5/8" NACO Joini[illegible] L[illegible]
2 9/16" Pear Link
2 1/2" Detach
1/2 Shot Cast Ste[illegible]
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1 Shot 2 1/2" Cast Ste[illegible]
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1 Shot 2 1/2" Cast Steel C[illegible]
2 1/2" Detach
2 9/16" Pear Link
3 5/8" NACO Joining Link
20,000 LB. Anchor w/Stabi[illegible]

### LEG D

3 5/8" NACO Joining Link
2 9/16" Pear Link
2 1/2" Detach
1 Shot 2 1/2" Cast Steel C[illegible]
2 1/2" Detach
Zinc Anode
2 1/2" Detach
1/2 Shot 2 1/2" Cast Steel Chai[illegible]
2 1/2" Detach
Zinc Anode
1 Shot 2 1/2" Cast Steel Ch[illegible]
2 1/2" Detach
2 9/16" Pear Link
3 2 3/4" Links
B Link
C Link
Shackle
30,000 LB. Anchor w/Stabilizer

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING P-1 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 9 foot diameter drum buoy, with a 44 inch freeboard and two wooden fenders, was reported in satisfactory conditon. Some rust pitting was reported on the buoy sides. Three to six inches of marine growth was observed on the buoy bottom and along the riser chain.

### Riser

The 2 3/4 inch riser chain, (2 1/4 inch chain is specified by DM-26 for Class C moorings), was reported to have worn to the point where >80% of its original wire diameter is remaining. The ground ring, located at a water depth of 25 feet, was reported as having >80% measurements also.

### Ground Legs

Ground leg 1 was reported by divers to have >80% double link measurements. The other two ground legs were reported in good condition (>90%). The parts list for this mooring indicates the existence of a backstay leg; however, divers noted only an extra detachable link and pear link on the ground ring but no leg was observed.

### Conclusion/Recommendation

Resulting from the >80% double-link measurements found on ground leg 1, it is recommended that this mooring be downgraded from a Class C to a Class D fleet mooring until it is overhauled.

MOORING NO.: P-1 CLASS: C LOCATION: NORTH ISLAND LAT: _____ LONG: _____

WATER DEPTH: 38'/35' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: DRUM 9'ø 44" F.B.

DATE: 8/17/82 ENGINEER-IN-CHARGE M. WALTER DIVER: D. AUSTIN, D. POELLET, B. HURT, N. GUEST

TIME: 1530

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | 3"-6" marine growth |
| RISER | NEAR BUOY | | 2⅞" | 2¾" | | | ✓ | | | | | 17" chain link |
| | MIDDLE | | ↓ | | | | | ✓ | | 15' | | |
| | NEAR GRD RG | | ↓ | | | | | | | | | |
| GROUND RING | | | 5½" | | 4¾ | | | | | 25' | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | | | | | ✓ | | 26' | | |
| | WEARPOINT | | | | | | | ✓ | | 35' | | 20' of chain from Ground Ring to mudline |
| GROUND LEG NO. 2 | UPPER END | | 2½" | | | | ✓ | | | 26' | | |
| | WEARPOINT | | | | | | ✓ | | | 35' | | 20' of chain from Ground Ring to mudline |
| GROUND LEG NO. 3 | UPPER END | | 2⅞" | | | | ✓ | | | 26' | | |
| | WEARPOINT | | | | | | ✓ | | | 35' | | 35' of chain from Ground Ring to mudline |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING P-1

RISER TYPE - CLASS "C"

4 LEGS

MATERIAL COST
$48,031

LEG "A" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2¼" Detachable Link
90' -- 2¼" C. S. Chain
2¼" Detachable Link
2 9/16" Pear Link
2½" E. Z. A. J. Link
15,000 # Stockless Anchor

LEG "B"(MAIN HOLDING)

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2½" Detachable Link
15' -- 2½" C. S. Chain
2½" Detachable Link
90' -- 2 7/16" C. S. Chain
2½" Detachable Link
2½" Pear Link
20,000 # Stockless Anchor

LEG "C" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2¼" Detachable Link
70' -- 2¼" C. S. Chain
2¼" Detachable Link
2 9/16" Pear Link
2½" A. J. Link
15,000 # Stockless Anchor

LEG "D" DETAILS

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2½" Detachable Link
7' -- 2½" C. S. Chain
2½" C. S. "E" Link
2½" NACO Conn. Link
13,000 # Stockless Anchor

RISER DETAIL

MK I Peg Top Buoy
39' -- 2 3/4" C. S. Chain
2 3/4" Detachable Link
2 3/4" "B" & "C" Links
3 5/8" NACO A. J. Link
5½" x 15" I.D. Ground Ring

HISTORY

| | |
|---|---|
| 7/28/48 | Placed |
| 8/26/53 | Reconditioned and Relaid |
| 6/16/58 | Reconditioned and Relaid |
| 6/14/61 | Reconditioned and Relaid |
| 6/2/65 | Reconditioned and Relaid |
| 4/23/75 | Reconditioned and Relaid |

**THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO FOR COMPARISON WITH DIVER INSPECTION REPORTS.**

## MOORING P-2 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 9 foot diameter, painted peg-top buoy was reported to have rust bleeding on its 56 inch freeboard and was equipped with two wooden fenders. The buoy and its respective hardware were reported in satisfactory condition.

### Riser

The 2 3/4 inch riser chain, was reported by divers to be in good condition (>90%). Divers did not observe a back-stay leg as indicated in the parts list. The riser chain immediately above the mudline was reported being shiny and clean from abrasion with the bottom.

An H-pile was observed by divers sticking up out of the bottom, 10 feet into the water column.

### Conclusion/Recommendation

Resulting from consistently satisfactory measurements taken on this mooring, it is recommended that it continue to be used by the fleet. However, this mooring does not fall into any standard classification and no estimate of its holding capacity is specified.

MOORING NO.: D-2 CLASS: C LOCATION: NORTH ISLAND LAT: _____ LONG: _____

WATER DEPTH: *32'/29' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: STAKE DILE BUOY TYPE: P26 TOP 9'ϕ 56" F.D.

DATE: 8/17/82 ENGINEER-IN-CHARGE M. WALTER DIVER: K. PLATT

TIME: 1500

| COMPONENTS | | BRN | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Wooden fenders Rust bleeding on sides |
| RISER | NEAR BUOY | | 2¾" | 2¾" | | | ✓ | | | 5' | | |
| | MIDDLE | | ↓ | ✓ | | | ✓ | | | 10' | | |
| | NEAR GRD RG | | ↓ | ✓ | | | ✓ | | | 30' | | shiny chain on bottom |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

December 1979

## MOORING P-2

### Riser 50' Stake Pile (W 12 x 120)

3 5/8" NACO A. J. Link
2 9/16" Pear Link
2 3/4" Detach
42' - 2 3/4" Cast Steel Chain
2 3/4" Detach
BC Link
2 3/4" Detach
MK-2 Peg Top Bouy

### Back-up Leg (Attached to NACO A. J. Link)

2 9/16" Pear Link
2 1/2" Detach
90' - 2 1/2" Cast Steel Chain
2 1/2" Detach
18,000 LB Stockless Anchor

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING T-1 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 10 foot diameter, painted drum buoy was reported to be riding low in the water (18 inch freeboard). Although its general condition was found to be satisfactory, the 18 inch freeboard would make the watertight integrity of the buoy suspect. Two to four inches of marine growth was reported on the bottom of the buoy and along its riser chain.

### Riser

The 2 1/2 inch riser chain was reported by divers to have >80% of its original wire diameter remaining. The ground ring was found to be in good condition.

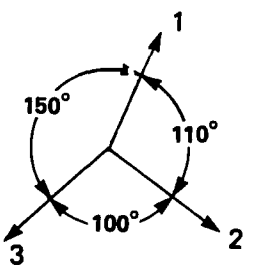
### Ground Legs

The 2 1/2 inch ground leg chains all had consistent wire diameter measurements of >80%. The anchor for ground leg 2 was observed 75 feet from the ground ring with its flukes up. A concrete clump was observed on shore with chain running into the water in the direction of ground leg 3; however, no direct connection was evident. The last 5 or 6 links on all of the ground legs are shiny from abrasion.

### Conclusion/Recommendation

Divers measured 2 1/2 inch mooring chain, which indicates a Class B mooring according to DM-26. Records indicate San Diego uses this mooring as a Class E fleet mooring.

The chain on this mooring was found to have >80% of its original wire diameter remaining, which normally indicates a need to downgrade the mooring by one class. The resulting Class C is still higher than the Class E required so this mooring should be adequate for its intended use.




GROUND LEG ORIENTATION

MOORING NO.: T-1 CLASS: E LOCATION: BALLAST PT. LAT: _____ LONG: _____

WATER DEPTH: 32'/27' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: 22UM 10'ϕ 18"F.B.

DATE: 8/23/82 ENGINEER-IN-CHARGE M. WALTER DIVER: B. NELSON, J. TORRENS

TIME: 1100

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW (FROM PARTS LIST) | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | 2" to 4" marine growth |
| RISER | NEAR BUOY | | 2½" | | | | | | | | | |
| | MIDDLE | | ↓ | | 2 1/16" | | | 4 3/8" | | 9' | | |
| | NEAR GRD RG | | ↓ | | | | | | | | | |
| GROUND RING | | | 4 5/8" | | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 2½" | | | | | | | | | All three legs have 5-6 links of clean chain on bottom |
| | WEARPOINT | 020° | ↓ | | 2 1/8" | | | 4 3/8" | | | | Buried 30' from Ground Ring |
| GROUND LEG NO. 2 | UPPER END | | | | " | | | | | | | Buried 15' from Ground Ring |
| | WEARPOINT | 130° | ↓ | | 2 1/8" | | | 4 3/8" | | | | Divers saw anchor with flukes up and shank down |
| GROUND LEG NO. 3 | UPPER END | | ↓ | | | | | | | | | Divers "strummed" leg under tension |
| | WEARPOINT | 230° | ↓ | | 2 1/8" | | | 4 3/8" | | | | Concrete block on shore with chain running into water in the direction of leg 3 |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING T-1

RISER TYPE - CLASS "E"

3 LEGS

LEG 1 and 2 DETAILS

1½ shot 2½" C. S. Chain
25,000 # IMP Stockless Anchor
4 5/8 Ground Rings (for U/W Inspection) 4/27/78

LEG 3 DETAILS (BRIDLE)

1½ shot 2½" C. S. Chain Connecting to Ground
Rings of T-1 and T-2

RISER CHAIN DETAILS

Drum Buoy (T-1)
Plastic Drum Buoy (T-2)
24'--2½" C. S. Chain (T-1)
26' -- 2½" C. S. Chain (T-2)

HISTORY

9/75 Installed

NOTE

No Parts List available; information taken from PWC Dwg No. 20338

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING T-2 INSPECTION RESULTS AND RECOMMENDATIONS

### Buoy

This 10 foot diameter, painted drum buoy with a 39 inch freeboard and one wooden fender at the top was reported to be in satisfactory condition.

### Riser

The 2 1/2 inch cast riser chain was reported by divers to have double link measurements of >80%. The ground ring was located on the bottom at a depth of 32 feet with its hardware lying on top of it.

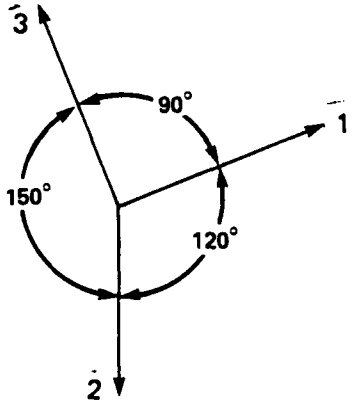
### Ground Legs

The 2 1/2 inch cast ground leg chains were reported in good condition except for ground leg 1. Ground leg 1 was reported as having a >80% double link measurement at its wearpoint on the bottom. All of the ground legs are buried in the mud approximately 15 feet from the ground ring.

### Conclusion/Recommendation

Divers measured 2 1/2 inch mooring chain, which indicates a Class B mooring, according to DM-26. Records indicate San Diego uses this mooring as a Class E fleet mooring.

The chain on this mooring was found to have >80% of its original wire diameter remaining, which indicates a need to downgrade the mooring by one class. The resulting Class C is still higher than the Class E required so this mooring should be adequate for its intended use.




GROUND LEG ORIENTATION

MOORING NO.: T-2 CLASS: E LOCATION: BALLAST PT. LAT: _____ LONG: _____

WATER DEPTH: 32'/28' TYPE MOORING: ☒ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: DRUM 10'ø 93" F.B.

DATE: 8/23/82 ENGINEER-IN-CHARGE M. WALTER DIVER: B. NELSON, J. TORRENS

TIME: 1000

| COMPONENTS | | BRNG | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW FROM PARTS LIST | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90 | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | Painted Metal; One fender at top |
| RISER | NEAR BUOY | | 2½" | | | | | | | | | |
| | MIDDLE | | ↓ | 2⅜" | | | | 4½" | | 10' | | |
| | NEAR GRD RG | | ↓ | | | | | | | | | |
| GROUND RING | | | 4⅝ | 4½" | | | | | | | | Ground ring on bottom with hardware on top of it. |
| GROUND LEG NO. 1 | UPPER END | | 2½" | 2¼" | | | 4½" | | | | | legs have shiny cast |
| | WEARPOINT | 060° | ↓ | | 2½' | | | 4¼' | | | | chain on bottom |
| GROUND LEG NO. 2 | UPPER END | | ↓ | 2¼ | | | 4½' | | | | | All legs bury approximately |
| | WEARPOINT | 180° | ↓ | | | | | | | | | 15' from the Ground ring. |
| GROUND LEG NO. 3 | UPPER END | | ↓ | 2¼ | | | 4½" | | | | | |
| | WEARPOINT | 330° | ↓ | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility 0-1' D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING T-2

**Leg 1 and 2 Details**

1 1/2 shot 1 1/2" C. S. Chain
25,000 # IMP Stockless Anchor
4 5/8 Ground Rings (for U/W Inspection) 4/27/78

**Leg 3 Details (Bridle)**

1 1/2 shot 2 1/2" C. S. Chain Connecting to Ground Rings of T-1 and T-2

**Riser Chain Details**

Drum Buoy (T-1)
Plastic Drum Buoy (T-2)
24' – 2 1/2" C. S. Chain (T-1)
26' – 2 1/2" C. S. Chain (T-2)

**History**

9/75 Installed

**Note**

No Parts List available; information taken from PWC Dwg No. 20338

THIS PARTS LIST HAS BEEN PROVIDED BY PWC SAN DIEGO
FOR COMPARISON WITH DIVER INSPECTION REPORTS.

## MOORING U.S.S. DIXON INSPECTION RESULTS AND RECOMMENDATIONS

### Ground Legs

The four mooring legs on the bow of the mediterranean mooring U.S.S. DIXON were inspected and reported by divers to be in good condition (i.e. >90% readings on all four legs). Legs 3 and 4 were reported to cross over each other twice.

The spring lines, on the stern of the U.S.S. DIXON, have been reported to have large anchors connected to them instead of clumps.

### Conclusion/Recommendation

This mooring is satisfactory for fleet use.

MOORING NO.: USS. DIXON Bow CLASS: BB LOCATION: Ballast Pt. LAT: _____ LONG: _____

WATER DEPTH: 45'/46' TYPE MOORING: ☐ RISER X MED. ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: MONG

DATE: 8/20/82 ENGINEER-IN-CHARGE M. WALTER DIVER: D. POELLET, S. HARDING

TIME: 0930 J. TORRENS, N. GUEST

| COMPONENTS | | NI | CONDITION | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| LEG NO. 1 | ~~NEAR GRD RG~~ | | 2¾" | 2¾" | | | | | | W.L. | | No GROWTH or RUST GOOD CONDITION |
| ~~GROUND RING~~ | | | 2¾" | 2¾" | | | | | | 45' | | 16" chain link |
| GROUND LEG NO. 2 | UPPER END | | 3⅜" | 3¼" | | | 6⅝" | | | W.L. | | DIELOCK CHAIN |
| | WEARPOINT | | 3⅜" | 3⅜" | | | 6¾" | | | 45' | | |
| GROUND LEG NO. 3 | UPPER END | | 3⅜" | 3¼" | | | 6⅝" | | | W.L. | | DIELOCK CHAIN |
| | WEARPOINT | | 3⅜" | 3¼" | | | 6⅝" | | | 45' | | |
| GROUND LEG NO. 4 | UPPER END | | 2¾" | 2¾" | | | 5 5/16" | | | W.L. | | Ground leg chains 3 and 4 cross over each other twice |
| | WEARPOINT | | 2¾" | 2¾" | | | 5 5/16" | | | 46' | | |

BOTTOM TYPE: ☒ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

MOORING NO.: 1155. DIXON STERN CLASS: _____ LOCATION: BALLAST PT. LAT: _____ LONG: _____

WATER DEPTH:* _____ TYPE MOORING: ☐ RISER X MED. ☐ TELEPHONE ANCHOR SIZE/TYPE: _____ BUOY TYPE: _____

DATE: 8/20/82 ENGINEER-IN-CHARGE M. WALTER DIVER: N. GUEST, S. HARDING

TIME: 1000

| COMPONENTS | | NI | CONDITION | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | Spring lines have huge anchors instead of clumps. 20' of double sampson to an anchor then detachable link, pear link, detachable link, stud link chain. |
| RISER | NEAR BUOY | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | |

BOTTOM TYPE: ☒ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING U.S.S. ELK RIVER INSPECTION RESULTS AND RECOMMENDATIONS

**Ground Legs**

Both legs of the Mediterranean mooring U.S.S. ELK RIVER were inspected by divers and reported to be in good condition (>90%).

**Conclusion/Recommendation**

This mooring is satisfactory for fleet use.

MOORING NO.: U.S.S. ELK RIVER CLASS: MED. LOCATION: BALLAST PT. LAT: _____ LONG: _____

WATER DEPTH: *42'/37½' TYPE MOORING: ☐ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: NS BUOY TYPE: NONE

DATE: 8/20/82 ENGINEER-IN-CHARGE M. WALTER DIVER: N. GUEST, J TORRENS

TIME: 1245

| COMPONENTS | | NI | CONDITION | | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 1¾" | 1¾" | | | 3½" | | | | | |
| | WEARPOINT | | ↓ | 1¾" | | | 3½" | | | | | |
| GROUND LEG NO. 2 | UPPER END | | | 1¾" | | | 3½" | | | | | |
| | WEARPOINT | | ↓ | 1¾" | | | 3½" | | | | | |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | |
| | WEARPOINT | | | | | | | | | | | |

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

*Measured Depth/Depth to Mean Low Water Springs

## MOORING YFNB-5 INSPECTION RESULTS AND RECOMMENDATIONS

### Ground Legs

Heavy marine growth was reported on both of the legs of the YFNB-5 Mediterranean mooring. The legs cross over each other at a depth of 10 feet and are reported to be without growth in this area. At a depth of 35 feet the chains are reported to be shiny from abrasion with the bottom. Single and double link measurements along the mooring chain show the chain to be in good condition (>90%).

### Conclusion/Recommendation

This mooring is satisfactory for fleet use.

MOORING NO.: YFNB-5 (BOW) CLASS: MED. LOCATION: BALLAST PT LAT: _____ LONG: _____

WATER DEPTH: 45'/40' TYPE MOORING: ☐ RISER ☐ TELEPHONE ANCHOR SIZE/TYPE: ____ BUOY TYPE: ____

DATE: 8/20/82 ENGINEER-IN-CHARGE M. WALTER DIVER: N. GUEST, S. TORRENS

TIME: 1130

| COMPONENTS | | NI | CONDITION | | | | | | | U/W VOLT READING | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NEW | SINGLE LINK % | | | DOUBLE LINK % | | | D | | |
| | | | | 90+ | 80+ | 80- | 90+ | 80+ | 80- | | | |
| BUOY-TOP HARDWARE | | | | | | | | | | | | |
| RISER | NEAR BUOY | | | | | | | | | | | |
| | MIDDLE | | | | | | | | | | | |
| | NEAR GRD RG | | | | | | | | | | | |
| GROUND RING | | | | | | | | | | | | |
| GROUND LEG NO. 1 | UPPER END | | 2" | 1 7/8" | | | 3 15/16" | | | | | Major marine growth chains cross @ 10' depth |
| | WEARPOINT | | ↓ | 1 7/8" | | | 3 15/16" | | | | | - no marine growth in this area. |
| GROUND LEG NO. 2 | UPPER END | | | 1 7/8" | | | 3 7/8" | | | | | Also shiny area at a depth |
| | WEARPOINT | | | 1 7/8" | | | 3 15/16" | | | | | of 35'. |
| GROUND LEG NO. ___ | UPPER END | | | | | | | | | | | Anchor seen with flukes down |
| | WEARPOINT | | | | | | | | | | | - much marine growth |

BOTTOM TYPE: ☒ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK

Visibility _____ D = depth NI = not inspected, inaccessible

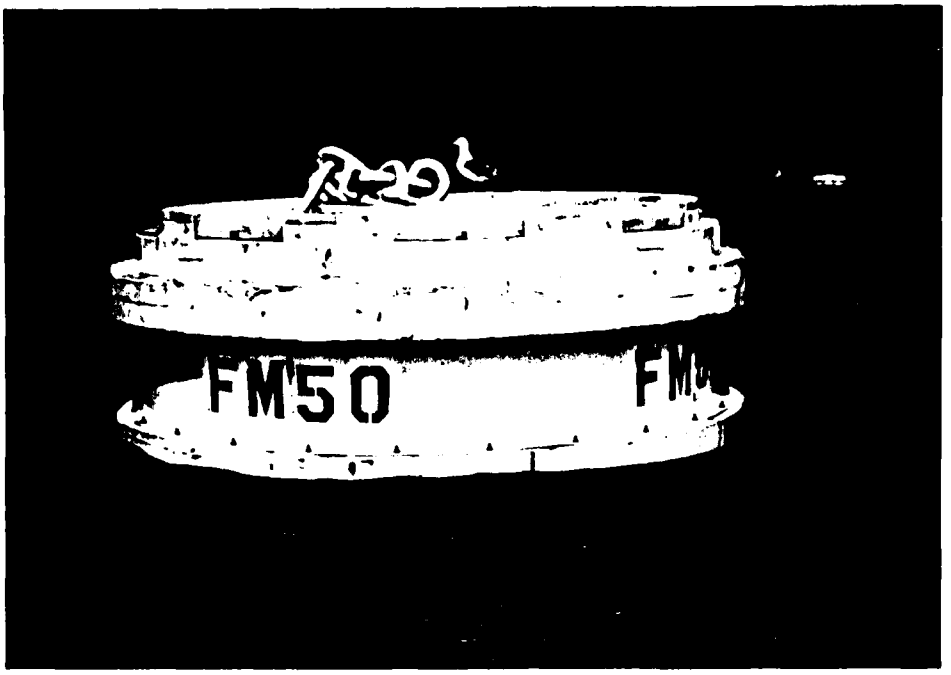
*Measured Depth/Depth to Mean Low Water Springs

# APPENDIX B

# PHOTOGRAPHS

Riser chain cleaned of growth for several links. Note also go/no-go gauge.

Example of buoy in fair condition. Note bands of rust bleeding .



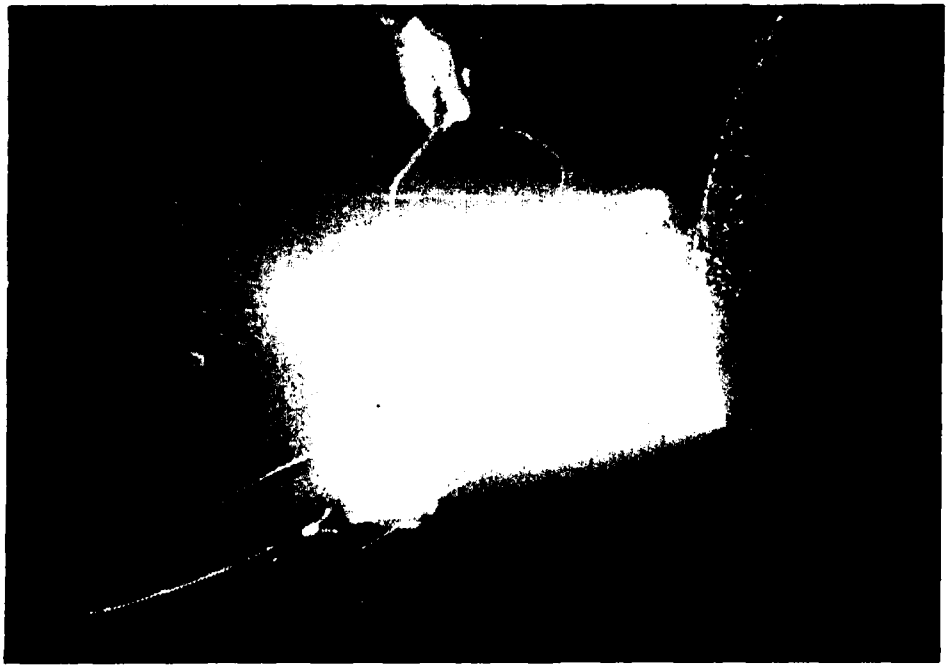

Painted metal peg-top buoy with a double wooden fender at the top and a single fender at the waterline. An example of a buoy in excellent condition.

Underside of FM-50; note connection of detachable link to buoy padeye

Diver taking a voltmeter reading of the underside of FM-50.

Diver taking double link go/no go measurement on riser chain of FM-51. Note absence of growth due to recent installation.

Diver taking single link caliper measurement of chain link to determine original chain size.



After taking a caliper measurement, diver compares to a ruler on the slate to determine length.

# APPENDIX C

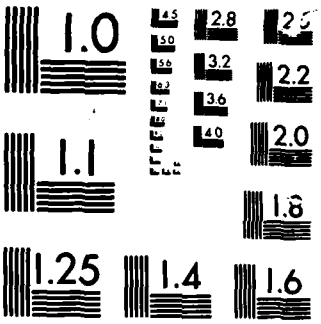
# INSPECTION LOG AND MESSAGES

## SAN DIEGO LOG

| | |
|---|---|
| 8/16/82 | – Met with Jim Deuchars at P.W.<br>Obtained drawings and information<br>– Visited Combat Camera to arrange for photographer<br>– Divers inspected DM-3 |
| 8/17/82 | – Divers inspected FM 48, 49, 50 , 51, P1 and P2 |
| 8/18/82 | – Divers redove FM 50 and 51 for photos, inspected FM 21 and 20, and redove FM 48 and 49 |
| 8/19/82 | – Divers inspected DM 5, 6, 8 and 11 and FM-19<br>– Bob Hurt and I contacted each ship to clear for diving operations |
| 8/20/82 | – Divers inspected Mediterranean moorings on the USS Dixon, YFNB-5 and USS Elk River |
| 8/23/82 | – Divers inspected DM 4, DM 9, CM-1, DM-G, T-1, and T-2<br>– (Divers replaced the X3 instrument on deperm range) |
| 8/24/82 | – Divers redove DM-4<br>– Debriefed PW<br>– Visited supply depot |
| 8/27/82 | – Visited UCT-2, at Port Hueneme<br>– Sorted slides, filled out travel voucher<br>– Read Seal Beach PEP |

AD-A166 647 SAN DIEGO FLEET MOORINGS INSPECTION REPORT(U) NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC CHESAPEAKE DIV 30 NOV 82 CHES/NAVFAC-FPO-1-82(29) 2/2

UNCLASSIFIED F/G 13/10 NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.8
3.2
3.6
4.0
MICROCOPY
CHART

01 03 RR 2741600

FROM. CHESNAVFACENGCOM WASHINGTON DC

TO. NAVSTA SAN DIEGO CA

INFO COMNAVFACENGCOM ALEXANDRIA VA

PWC SAN DIEGO CA

UCT TWO

UNCLAS //N11000//

SUBJ: FLEET MOORING INSPECTION; SAN DIEGO

1. AS PART OF THE FLEET MOORING MAINTENANCE PROGRAM, CHESDIV WITH SUPPORT FROM UCT-2, INSPECTED FLEET MOORINGS AT SAN DIEGO FROM [illegible] AUG 82. RESULTS OF THIS INSPECTION SHOW MOST OF THE MOORINGS ARE IN GOOD CONDITION. HOWEVER, DUE TO THE NORMAL CYCLE OF CHAIN DEGRADATION AND WEAR, SERVERAL MOORINGS REQUIRE IMMEDIATE ATTENTION.

2. INSPECTION RESULTS INDICATE SERIOUS WEAR ON TWO MOORINGS, DM-4 AND DM-6. USE OF THESE MOORINGS SHOULD BE DISCONTINUED UNTIL AN OVER-HAUL OCCURS.

3. INSPECTION RESULTS ALSO SHOW SIGNIFICANT WEAR ON EIGHT MOORINGS. USE OF THESE MOORINGS SHOULD BE AT A DOWNGRADED CLASSIFICATION. IN THREE CASES, DM-3, T1 AND T2, THE DOWNGRADED CLASSIFICATION IS STILL HIGHER THAN THE REQUIRED CLASSIFICATION SO THAT THE MOORINGS SHOULD BE ADEQUATE FOR ITS INTENDED USE. IN FOUR CASES DM-5, FM-21, FM-48

6 5 4 3 2 1 0

DISTR:

DRAFTER TYPED NAME TITLE OFFICE SYMBOL PHONE: M. WALTER 33881 FPO-1FP PDC 1 OCT 82

SPECIAL INSTRUCTIONS: COPY TO: FPO-1FP PDC...FPO-1FP... FPO-1FP2...00...09... 0161...DAILY

RELEASER: TYPED NAME TITLE SIGNATURE OFFICE SYMBOL PHONE: G. H. SELTZER, LCDR, CEC, USN

SECURITY CLASSIFICATION: UNCLASSIFIED

DATE TIME GROUP: 012000Z

DD [illegible] 173/2 (OCR) PREVIOUS EDITION IS OBSOLETE

02 .. 03 RR 2741.00

AND P1. THE DOWNGRADED CLASSIFICATION IS LOWER THAN THE REQUIRED CLASSIFICATION SO THESE MOORINGS MAY NOT BE ADEQUATE FOR THEIR INTENDED USE AND SHOULD BE OVERHAULED AS SOON AS POSSIBLE. THE REMAINING MOORING, DM-8, DOES NOT FALL UNDER A STANDARD DM-26 CLASSIFICATION. THEREFORE, A DOWNGRADE IS RECOMMENDED BUT IT IS DIFFICUL TO DETERMINE A REDUCED CLASSIFICATION. A SEVERE CRACK IN THE TOPSI BUOY PADEYE OF DM-8 WAS ALSO NOTED DURING THIS INSPECTION AND SHOU BE INVESTIGATED IMMEDIATELY.

4. A LARGE SUNKEN BOAT WAS DISCOVERED ACROSS THE GROUND LEG OF FM-19. AS A RESULT OF A PHONECON BTWN M. WALTER AND J. DEUC 17 SEP 82, CHESDIV UNDERSTANDS THIS SITUATION WILL BE CORREC

5. A SUMMARY OF SIGNIFICANT FINDINGS AND RECOMMENDATIONS IS AS FOLLOWS:

| MOORING | FINDINGS | CLASSIFICATION | RECOMMENDATION |
|---|---|---|---|
| DM-4 | -80% | D | DISCONTINUE USE |
| DM-6 | -80% | UNKNOWN | DISCONTINUE USE |
| DM-3 | +80% | D | DOWNGRADE TO 'C' |
| T1 | +80% | E | DOWNGRADE TO 'C' |
| T2 | +80% | E | DOWNGRADE TO 'C' |

6 5 4 3 2 1 0

DISTR.

DRAFTER TYPED NAME TITLE OFFICE SYMBOL PHONE | SPECIAL INSTRUCTIONS:

RELEASE: TYPED NAME TITLE OFFICE SYMBOL AND PHONE | SIGNATURE | SECURITY CLASSIFICATION | DATE TIME GROUP

DD FORM 173/2 (OCR) PREVIOUS EDITION IS OBSOLETE

03 - 03 RR 2741600

| | | | |
|---|---|---|---|
| DM-5 | FROM: +80% | D | DOWNGRADE TO 'E' |
| FM-21 | TO: +80% | BB | DOWNGRADE TO 'C' |
| FM-48 | +80% | B | DOWNGRADE TO 'C' |
| P1 | +80% | C | DOWNGRADE TO 'D' |
| DM-8 | +80% | UNKNOWN | DOWNGRADE |
| | SEVERE CRACK IN PADEYE | | INVESTIGATE CRACK |
| FM-19 | SUNKEN BOAT | | REMOVE BOAT |

6. FOR FURTHER INFO CONCERNING THIS INSPECTION, CONTACT E.I.C. M. WALTER AT A/V 288-3881.

6 5 4 3 2 1 0

DISTR:

DRAFTER TYPED NAME TITLE OFFICE SYMBOL PHONE | SPECIAL INSTRUCTIONS

RELEASER: TYPED NAME TITLE OFFICE SYMBOL AND PHONE | SIGNATURE | SECURITY CLASSIFICATION | DATE TIME GROUP

DD FORM 173/2 (OCR) PREVIOUS EDITION IS OBSOLETE

01 01 RR 2231600

FROM: CHESNAVFACENGCOM WASHINGTON DC

TO: NAVSTA SAN DIEGO CA

INFO COMNAVFACENGCOM ALEXANDRIA VA

UCT TWO

WESTNAVFACENGCOM SAN BRUNO CA

PWC SAN DIEGO CA

UNCLAS //N11000//

SUBJ: FLEET MOORING INSPECTIONS

1. AS PART OF THE NAVFAC FLEET MOORING MAINTENANCE PROGRAM, CHESNAVFACENGCOM WILL INSPECT THE FLEET MOORINGS AT SAN DIEGO [illegible] DIVER SUPPORT FROM UCT TWO. E.I.C. MS. M. WALTER, P.O.I.C. [illegible] UCT TWO WILL ARRIVE 16 AUG 82.

2. CONCURRENCE IS ASSUMED UNLESS OTHERWISE NOTIFIED. POC AT THIS COMMAND IS MR. JAMES MCLAUGHLIN, A/V 288-3881.

DISTR:

| DRAFTER TYPED NAME TITLE OFFICE SYMBOL PHONE | SPECIAL INSTRUCTIONS |
|---|---|
| M. M. WALTER FP0-1FP(PDC) 433-3881 11 AUG 82 | COPY TO: FP0-1FP(PDC)...FP0-1FP2 ...FP0-1FP...FP0-1C7... 0161...DAILY |
| RELEASER TYPED NAME TITLE OFFICE SYMBOL AND PHONE: G. H. SELTZER, LCDR, CEC, USN | |
| SIGNATURE: [signature] | SECURITY CLASSIFICATION: UNCLASSIFIED |
| | DATE TIME GROUP: 1218/0Z AUG 82 |

DD [illegible] 173/2 (OCR) PREVIOUS EDITIONS [illegible]

END

FILMED

6-86

DTIC